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ELECTRIC RAILWAY JOURNAL

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The bus industry finally came into its own only with vehicles developed for its own particular type of work. Now it is coming to wheels of the same kind. Never have the complex requirements of safety, speed, convenience and economy been met as in Spoksteel wheels. Their design makes it possible to use the finest material that has ever been put into steel wheels! A product of the world's largest wheel organization.

MOTOR WHEEL CORPORATION, Lansing, Michigan
WOOD WHEELS · STEEL WHEELS · STAMPINGS

A Place In the Sun

THE suburban urge to get where there is sunshine, fresh air, and room to play, is accelerated by comfortable low-cost transportation.

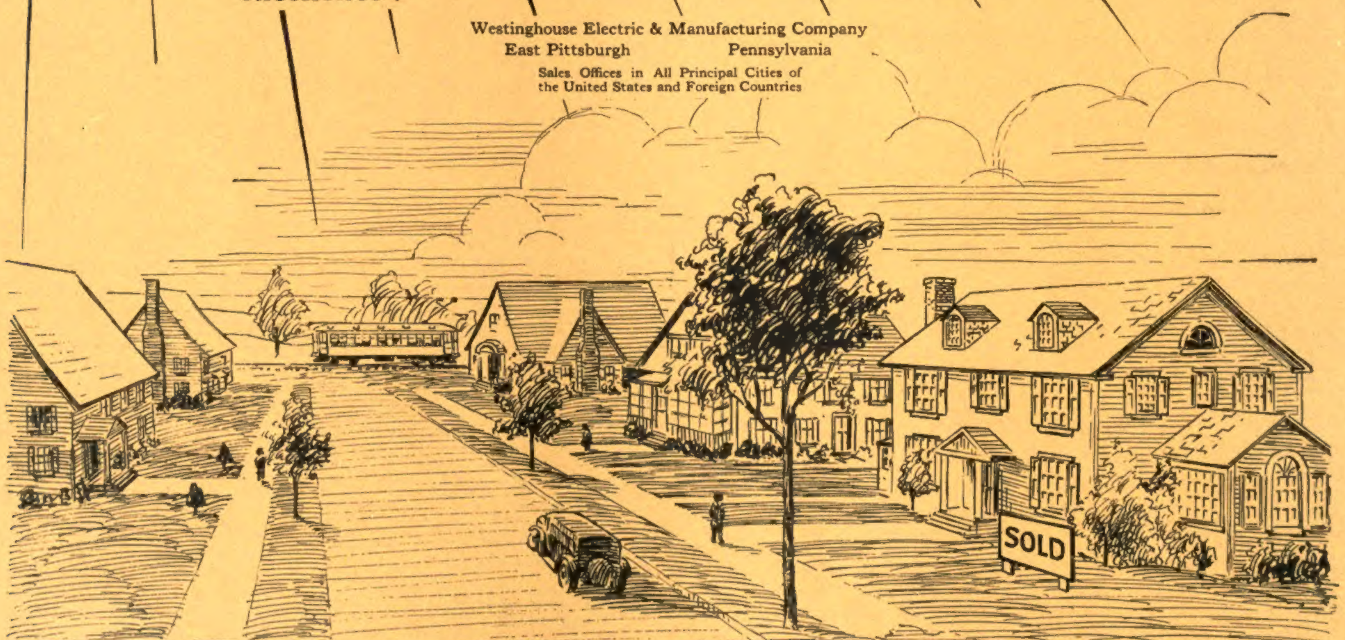
Many electric lines are turning this natural desire into profits by popularizing the suburbs.

One of the most successful is the Chicago, North Shore and Milwaukee Railroad. The far-sighted management of this road has increased its net earnings more than 550% in ten years by making a place in the sun for Chicago's millions.

Perhaps a share in this success is due to Westinghouse. The luxurious trains of the Chicago, North Shore and Milwaukee Railroad are almost entirely Westinghouse-equipped. Quoting B. C. Forbes—"with perhaps the best equipped suburban line in America, it is equally notable for its mechanical excellence".

MEMBER
AMERICAN ELECTRIC RAILWAY ASSOCIATION
AERA
1927

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries



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London, England

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CONTENTS

MAY 7, 1927

Editorials 803

"Make April Safe" Was Philadelphia Slogan 806

Under the general sponsorship of "Will Livelong," the safety sage, an intensive month-long campaign was carried on to reduce street accidents. Enthusiastic support to the movement was given by all aggressive factors in the community.

Durable Highway Crossing Made of Old Rail 812

BY S. CLAY BAKER.

Determination of Ton-Mile Freight Cost 813

BY A. B. COLE.

Factors to be considered in rate making. Analysis of the units of cost in electric freight transportation. Consideration of principles for allocation of expenses between passenger and freight operating service.

Simplified Pass Form in Norfolk 815

Chicago Extends Construction of Concrete Loading Platform 816

BY L. M. TRAISER.

Experience with sample installations leads to adoption of this safety feature as part of street improvements. Bulkheads and flashing signs add safety.

British Car Designed for Noiseless Operation 817

Single-deck, double-truck vehicle built at Bradford has two 63-hp. motors spring suspended from the car underframe. Remote axles are driven by propeller shafts.

Light Metal for Car Construction in Europe 819

"Dress-Up" Day Sponsored by Cleveland Southwestern 820

First Aid School Has 335 Graduates 821

The Readers' Forum 821

Prize Contest Announcement 823

Maintenance Notes 824

Association News and Discussion 827

Railway Section Shows Enthusiasm at New Orleans 827

The Public Is Getting Better Understanding of Local Transportation 828

BY LUCIUS S. STORRS.

Community Welfare Demands Transportation Improvements 830

BY W. H. SAWYER.

Training Electric Railway Employees for Their Jobs 831

BY A. J. SARRE.

How Far Should We Go in "Dressing Up" Street Cars? 833

BY J. G. HOLTZCLAW.

Telling the Company's Story to a New Man 834

BY C. A. BRANN.

News of the Industry 835

Your Baedecker

AT EASTER TIME

—or any other time—the most pleasant way to travel between INDIANAPOLIS and LOUISVILLE is on INTERSTATE'S fast, modern electric trains.

INTERSTATE
The Electric Way

No smoke, dust or cinders

GUIDE-BOOK gluttons and map munchers are prospecting on their annual summer debauch. Some in their imaginations have already won the deck tennis and shuffle board contests. Others in the observation car of a "limited" are racing now through flatlands, now through hilly regions. For the inveterate traveler, Thomas Cook & Sons and Raymond & Whitcomb are indispensable aides. But what of the daily idler, the week-end addict who traverses the path of fancy or impulse? He follows no regimen of roaming. He is purblind to the "Pictures Ahead."

To such wanderers the ELECTRIC RAILWAY JOURNAL is a Baedecker in disguise. For tucked away in an inconspicuous position, unembellished and unexpanded, is a short news note containing a suggestion for a happy holiday. Now that May, the harbinger of summer holiday, is here, the JOURNAL will announce summer schedules and special excursion rates on railway and bus lines. Railway managers should study the efforts being made on various properties to attract and stimulate tourist business. The privately-owned vehicle isn't necessarily a happiness insurance policy. Let Mr. Cook take you abroad. The JOURNAL can help to show you America.

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Advertising Index—Alphabetical, 66; Classified, 62, 64, 66; Searchlight Section, 61

SAVING THE RAIL SAVES THE RAILWAY

Make the service right, then sell it

The first requisite in merchandising anything is a saleable product. The only service you can sell is a service your public will buy. You can sell rides that are speedy, safe, silent and smooth.

You can provide such service only on well-maintained track.

Whatever you do to sell, whatever you do to provide fine cars—first provide well-maintained track.

Here are some of the widely used tools that make track maintenance a true economy.

Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

Chester F. Gailor, 30 Church St., New York
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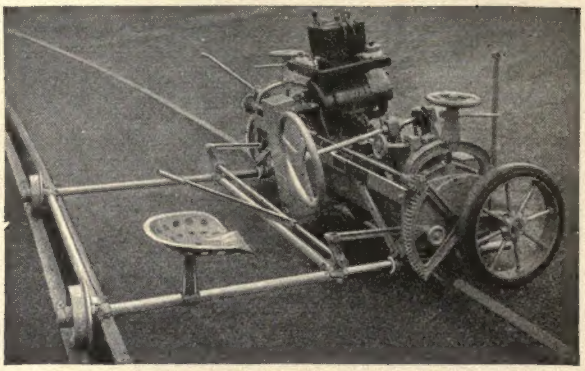
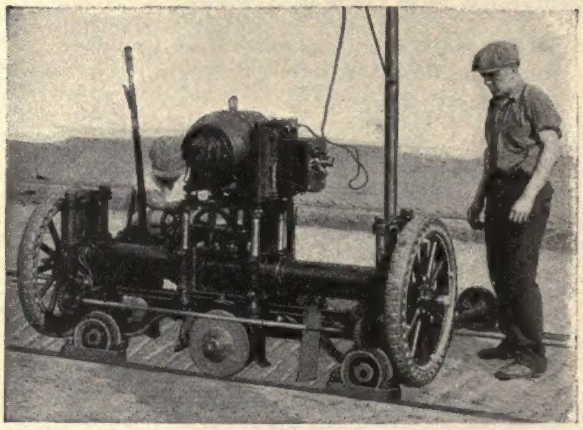
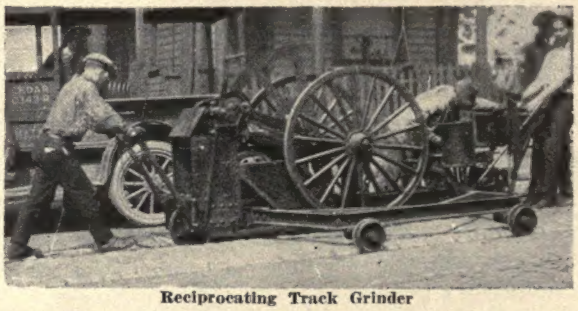


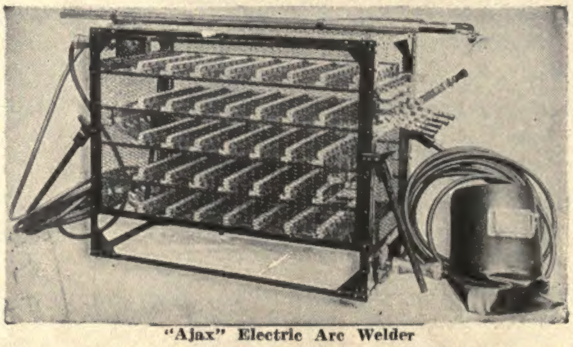
"Improved Atlas" Rail Grinder



"Imperial" Track Grinder

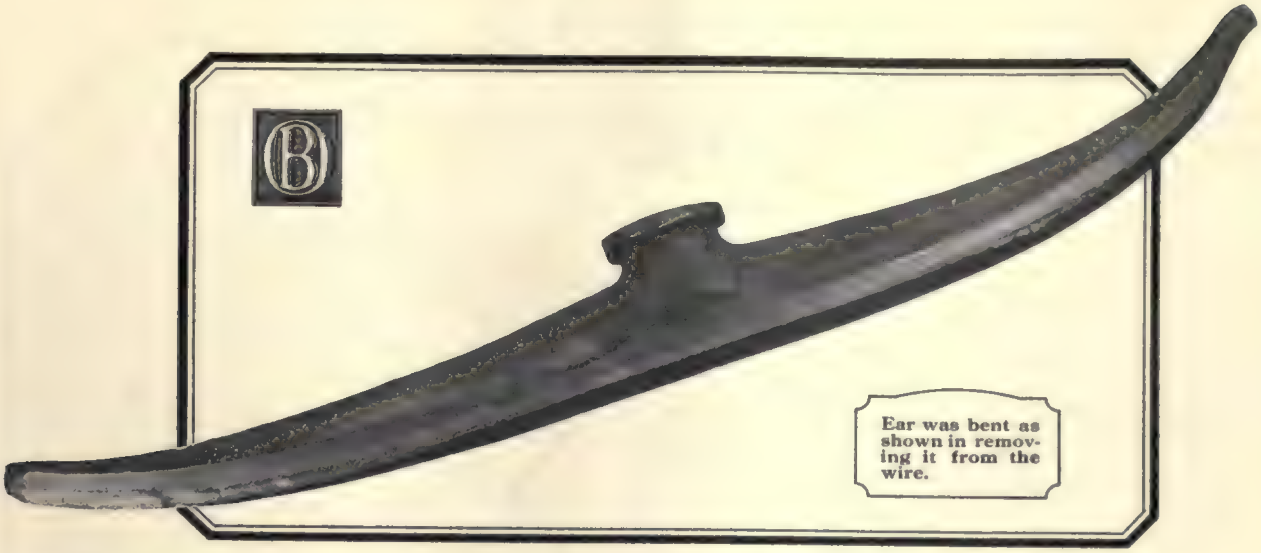


Reciprocating Track Grinder



"Ajax" Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY



Ear was bent as shown in removing it from the wire.

After 701,478 Car Passes, This Marathon Still Held the Wire

INSTALLED Jan. 11, 1924, removed Dec. 9, 1926, the Marathon Ear shown above was in continuous service 35 months, almost three years. When replaced with a record of 701,478 car passes to its credit, there was still enough metal, two or three inches from each end of the ear, to retain the trolley wire.

On the property where this ear was used, trolley lines are inspected and repaired after each 200,000 to 250,000 car passes. That is the service which this property regularly expects from Marathon Ears. But in order to determine just how long a Marathon would last without dropping the wire, the ear shown above was not removed until it had given almost three times the maximum expected service, on a line where the wire was about to be renewed.

The ear was installed on a decided upgrade, at a point where cars frequently do not stop. However, its location directly behind a car stop resulted in the drawing of small current when the stop was made. Therefore, the ear received practically the same service it would normally receive between stops on a level track.

As a result of the service records which Marathons have made on this property (one of the largest electric railways in the East), trolley ear requirements are now 75% less than formerly. And Marathons are used exclusively.

The Famous O-B Marathon Ear

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
333B

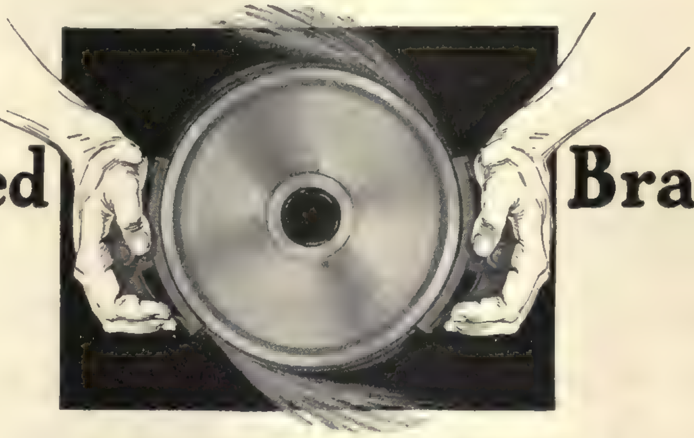
Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

ASF

Balanced Braking



In line with modern principles

Higher rates of retardation are demanded as a part of the program of speedier suburban and street railway service. With two brake shoes per wheel instead of one, the clasp brake is admirably suited to producing maximum retarding effect, with minimum strain and wear on truck and journal parts.

Balancing the heavy braking forces on opposite sides of the wheel has many advantages

1. **Less journal box wear.**
2. **Permits wheel to follow freely, vertical inequalities in track.**
3. **Makes use of flanged brake shoes practical.**
4. **Higher co-efficient of friction.**
5. **Divides energy absorption between two shoes, thus reducing heating effect from brake application.**
6. **Reduces frequency of brake shoe replacements on the car.**

AMERICAN STEEL FOUNDRIES
NEW YORK CHICAGO ST. LOUIS

American Multiple Unit Clasp Brake

"Back in 1917"

….. "started a series of tests to determine the best track foundation

—*"the railway company, however is required to maintain the paving between and adjacent to the tracks."*

So, back in 1917, the railway engineer of a certain traction company started a series of tests to determine the best track foundation and a study was made of all types of substitute ties.

One stretch of track thus experimentally laid with solid concrete foundation and International Steel Ties held up remarkably well. It is in as good condition today as the day it was laid and this is not true of any of the other experimental stretches then laid.

So it is perhaps only natural that this same company—in constructing new track—should specify the type of track construction that proved best in practice.

This sort of performance is being given by Twin Ties on more than 200 properties in this country. So, be sure that you look over our new Paved Track Notebook before your track plans for 1927 are too far developed.

International Steel Tie Co.
Cleveland, Ohio

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track

Interlocking brakes and doors by means of the M-28 Brake Valve with selective control, increases safety and convenience.

How to make cars SAFE *and make them* SAVE

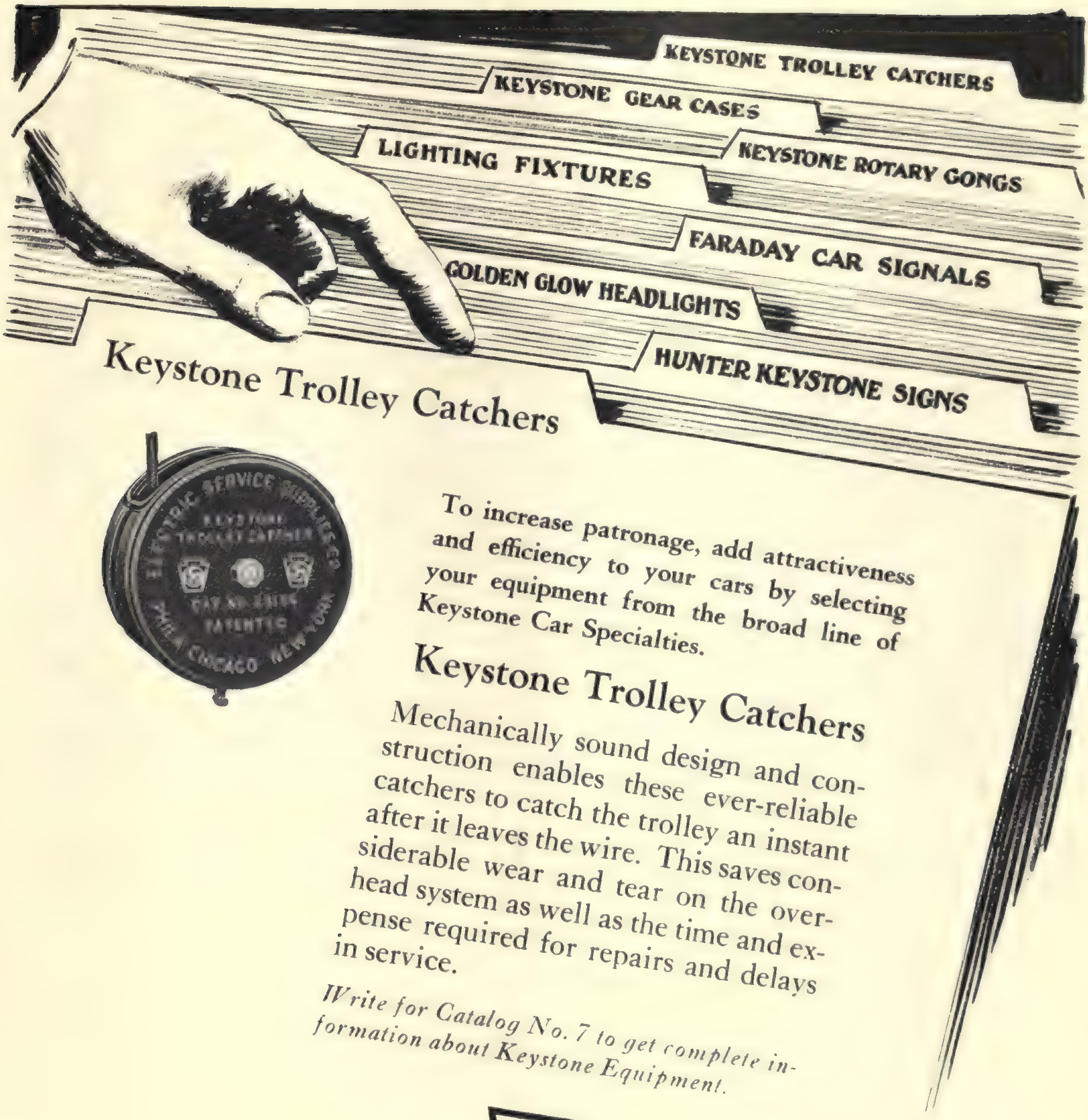
MORE than 14,000 cars are now active demonstrations that operating safety is increased and operating expense is decreased when operating responsibility is centralized in one man whose duties are safeguarded and simplified by complete protective and labor-saving devices which interlock car-control, door-opening, and brake-manipulation functions.

Make *your* new cars safe, and make them save with the Safety Car Control Equipment.

We make the Safety Car Control Devices which make the Safety Car.

SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

Interlocking the power and brakes by means of special controller handle provides safeguard against operator's inattention or disability.



Keystone Trolley Catchers

To increase patronage, add attractiveness and efficiency to your cars by selecting your equipment from the broad line of Keystone Car Specialties.

Keystone Trolley Catchers

Mechanically sound design and construction enables these ever-reliable catchers to catch the trolley an instant after it leaves the wire. This saves considerable wear and tear on the overhead system as well as the time and expense required for repairs and delays in service.

Write for Catalog No. 7 to get complete information about Keystone Equipment.

TRADE MARK

ELECTRIC SERVICE SUPPLIES CO.

PHILADELPHIA
17th and Cambria Sts.

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50 Church St.

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1123 Bessemer Building

BOSTON
88 Broad Street

SCRANTON
316 N. Washington Ave.

DETROIT
General Motors Building

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Coördination and Modernization

FOR over half a century the Westinghouse Air Brake Company, the largest manufacturer of braking devices in the world, has contributed to the development of transportation in all its branches.

Throughout the world are found installations by Westinghouse, whose invaluable knowledge of transportation problems and their solution, and coordination with the builders of transportation equipment, both in rail and highway fields, has the modern equipment that plays such a large part in our transportation systems of today.

Modern commodious coaches, fleet as the trimmest roadsters in the highway, but with many times their bulk, are adequately controlled by the Westinghouse Automotive Air Brake, and despite their ability to reach high speeds are thus kept within the bonds of safety.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES

HERE TRACKS LAY BURIED TEN FEET DEE

Yellow Coaches

to the rescue

when **NASHVILLE, TENNESSEE** *lay deep in flood*

YELLOW KNIGHT

When the seven new the way

Nashville, Tennessee will long remember Christmas week when the Cumberland River overflowed its banks and buried thirteen of the Nashville Railway and Light Company's lines under water.

Transportation became a grave problem. Officials and employees stuck to their posts to avoid a complete shut down, working days and nights without sleep.

Fortunately, when the flood reached the perilous stage, seven new Yellow Coaches arrived from Chicago; the property of the Tennessee Transportation Company, a subsidiary of the street railway.

Halted just outside the flooded area, these new

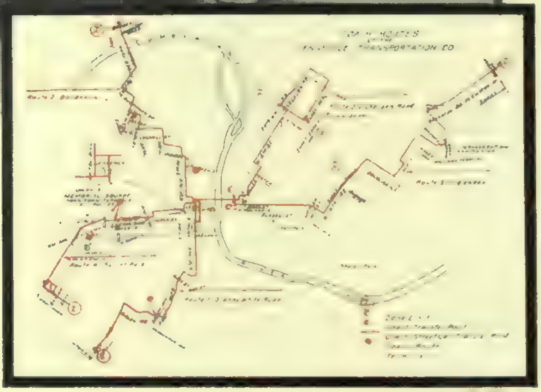
flood hit *Nashville*, YELLOW COACHES *were on*

coaches were pressed into emergency service. They were called upon to play a heroic part, transferring the very first water marooned passengers around the flood section to waiting street cars.

Many times these Yellow Coaches plowed through water right up to the motor. Often the water actually ran into the bodies—*but they kept going.* For ten days the fleet maintained wherever possible their regular route schedules, and in addition relieved the flood situation in localities where transportation was imperative. Yet under the hardest service imaginable, no operating or mechanical difficulties of any kind developed. Every Yellow Coach came through. Every one stood the gaff, taking what came and asking no favors. And how they were driven!

As an example of co-ordinated service between street cars and motor coaches, what happened in Nashville is outstanding. As a supreme test of equipment, the Nashville flood established a new yardstick for measurement.

YELLOW KNIGHT



"Ride the new coaches and save your automobile"

says the Tennessee Transportation Co.

And Nashville is responding.

Only Yellow Coaches are used on the five routes operated by the Tennessee Transportation Company; all Type Z 29-passenger models. Thirteen Yellow Coaches comprise the fleet, and the operating company never refers to them as "buses." To officials, employees and passengers they are "coaches," distinguishing a de luxe type of service not to be confused with the ordinary type of bus.

As the company expresses it in their advertising—

"The new motor coaches carry you in luxury. They are beautiful in appearance, both inside and out. Their deep, double-spring cushions make your ride one of utmost ease and comfort."

* * * *

You may never have flood conditions to cope with, but Yellow Coach plus General Motors builds into every coach ample reserve to meet any sudden emergency, whether in regular or special service.

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.

"Courtesy Equipment"
Builds Good Will

COURTEOUS treatment of your passengers eventually means ***more*** passengers.

National Pneumatic Door and Step Equipment is "courtesy equipment" which prevents slammed doors, noisy operation, tardy opening, discourteous closing and other annoyances which grate upon the ears and nerves of riders.

NATIONAL PNEUMATIC COMPANY
Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

Safeguard and Accelerate Traffic

Automatic Signals by providing proper spacing of cars or trains, reduce trip time and enable more cars to be operated with consequent safety.

Interlocking installations at terminals and at grade crossings eliminate unnecessary stops and assure route continuity by means of signal indications.

Highway crossing protective devices of the flashing light, automatic flagman, or audible type, or combination of same, are a dependable insurance which soon pays off the investment.

Power operated remotely controlled switches are being used economically to accelerate Electric Railway traffic.

These Systems are products of the

TRADE MARK **Union Switch & Signal Co.** TRADE MARK
SWISSVALE, PA.

Passenger Preferred transportation

—*truck design plays a vitally important part*

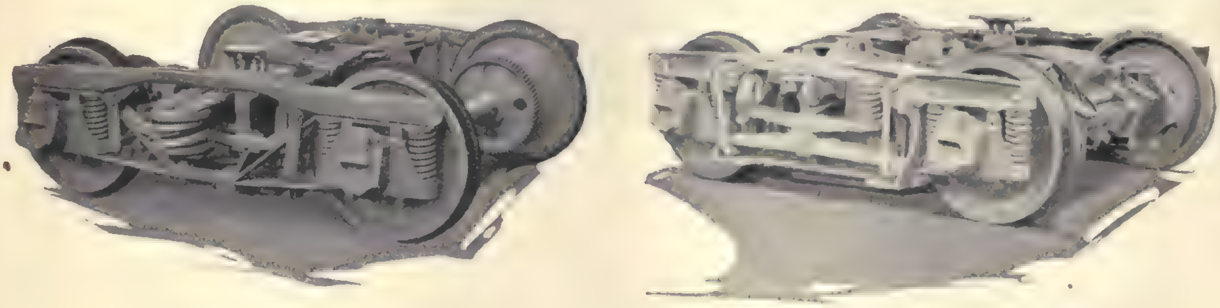
Passengers ride in the car, but the car in turn rides on the truck *and that is really where passenger comfort begins.*

Balanced design as applied to Cincinnati Trucks functions therefore to assure a new standard of riding ease, plus the greater inherent stability necessary with modern lightweight cars.

Two distinct types have been developed. The one a unique high speed truck for fast interurban work. And the other a greatly improved city-type truck of more conventional design for city or suburban service. In each case construction is marked by a very drastic elimination of possible "noise centers." The high speed truck in addition is equipped with a special type of suspension to eliminate "nosing" and "sidesway," even on light cars travelling 60 m.p.h., and also with the new Duplex Air and Magnetic Brakes.

The city type truck features additional springs and "snubbers" to dampen road oscillation and also a special type of brake rigging to eliminate chatter.

Which goes to show that Balanced Design means an accurate balance of revenue producing values in the unseen as well as the obvious features of New car construction.

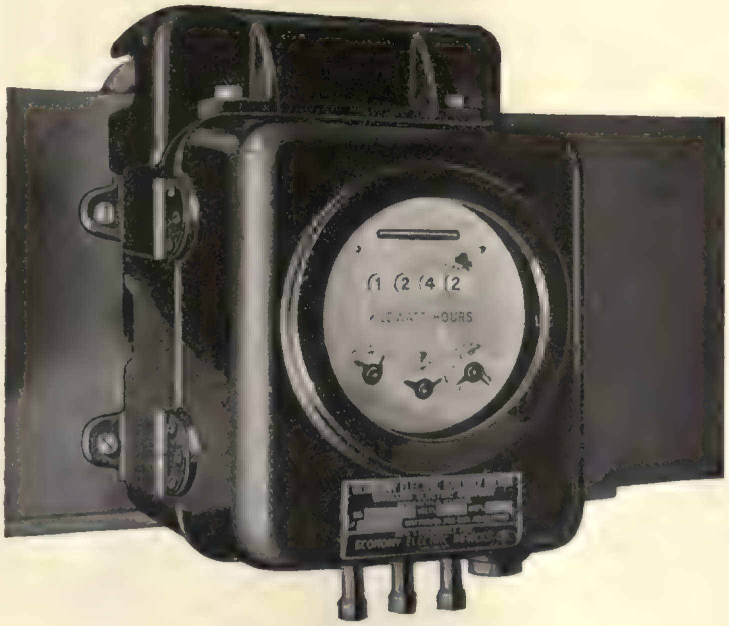


CINCINNATI CAR COMPANY
Cincinnati, Ohio

CINCINNATI
New
CARS

A step ahead of the modern trend

KANSAS CITY
ORDERS 747



How It Inspects

This is a rugged watt-hour meter. Top dials for motormen's power-saving records. Lower dials for car inspection use.

When the meter-driven hand on dial A reaches the marker set for this car at 6, the barnman knows that the brakes and controllers have done their work and are due for an inspection.

Likewise dial B shows when the car has done sufficient work to require oiling. This supplants the usual time or mileage period for oiling.

Dial C shows when the car has done sufficient work to require general inspection.

After any inspection the meter-driven hand is set back to zero by means of its reset rod at the bottom of the case.

A lock prevents unauthorized resetting of inspection dial.

The Economy meter with inspection dials is readily adaptable to any electric car or locomotive operating condition.

To Save Power at the Car

To Save Labor at the Car House

Metering the Energy—

PUBLIC SERVICE

ECONOMY METERS

WITH·CAR INSPECTION DIALS

Every passenger motor car operated by the Kansas City Public Service will be equipped with an ECONOMY Meter with power saving and car inspection dials. This notable purchase follows a thorough investigation of power saving in modernized mass transportation.

Energy input is the correct measure of the relative efficiency of different men operating under similar conditions.

The motorman has faith in a meter because with it he can prove that good operation gives him a good record and poor operation a poor record, in actual energy consumption.

This power-saving device actually tells the motorman and the management whether power has been saved or wasted, and how much.

That, in brief, is the underlying reason for the success of the ECONOMY Meter.

The ECONOMY "Power-saving" and Car Inspection Meter provides a method that accurately and automatically shows when car inspection is needed. It also shows at a glance how much more work a car can do before inspection is needed, or, in case of a road failure, how much work the car has done previous to the failure. All this without any clerical labor.

The ECONOMY Meter is a rugged device which requires remarkably little maintenance. Its principal element is also produced for central station and general metering. For this purpose more than 500,000 have been built. It is a standardized product, easy to maintain on a railroad at a cost averaging less than $2.00 per year, per meter.

More than two hundred street and interurban railways are equipped. The savings more than wipe off the capital charges plus operating expense of the meters in the first year.

The records from ECONOMY Meters are of high value for managerial and engineering purposes.

Economy Electric Devices Company
37 W. Van Buren St., Chicago

National Railway Appliance Co., New York
L. A. Nott, San Francisco
Burton R. Stare Co., Seattle

Cable Address: Sangamo, Chicago
Ludwig Hommel & Co., Pittsburgh

Grayson Railway Supply Co., St. Louis
Detroit Railway Supply Co., Detroit
Alfred Collyer & Co., Montreal, Quebec

Improves Car Operation

Here it is!
St. Louis Car Company
St. Louis, U.S.A.
Quality
City Cars

a catalog that illustrates cars that are making money for their operators

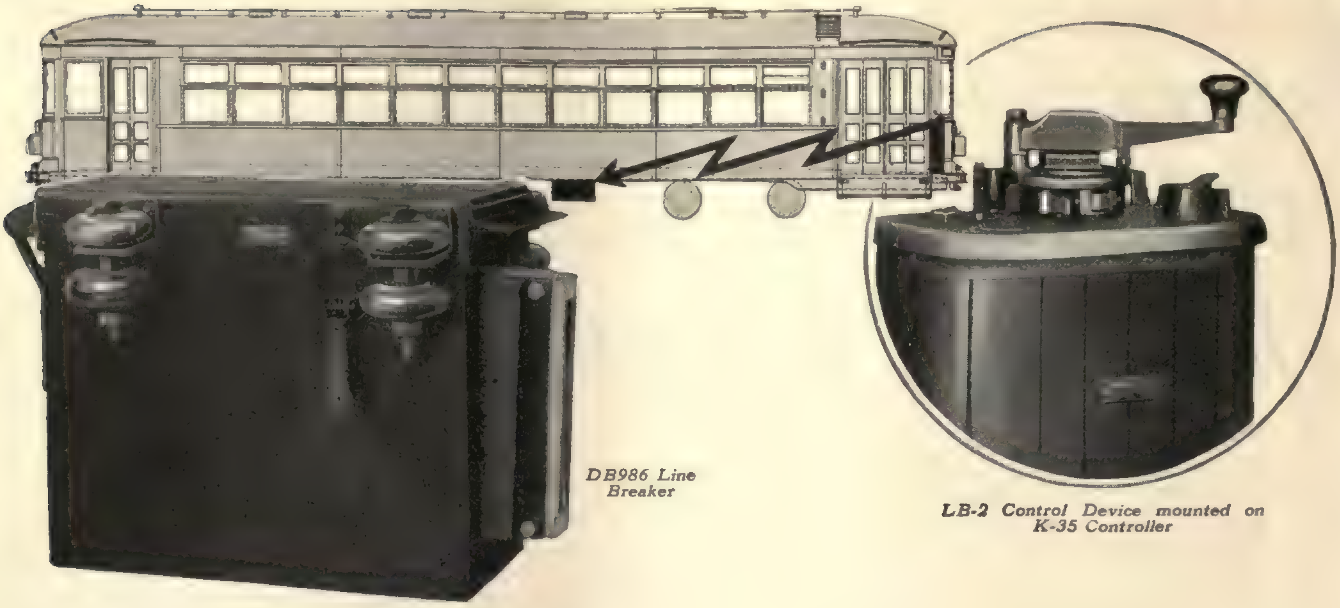
Since 1887, St. Louis Quality Shops have kept faith with transportation requirements in producing cars which fulfill the the specific needs of their operators.

In today's modernization programs, operators recognize the fact that manufacturing facilities, integrity of purpose, ability to understand and execute difficult orders, are vital to the success of the equipment needed. And operators find that the Quality Shops, in personnel, in production methods, in all-round understanding of results to be accomplished, and in the cars achieving them, is rendering a service of tremendous importance to the industry.

This modern service is expressed in the cars we build. They are illustrated and described in our new catalog No. 105. We shall be glad to send you a copy on request.

St. Louis Car Co.

Quality Cars



DB986 Line Breaker

LB-2 Control Device mounted on K-35 Controller

Break the Current under the Car

With the new G-E Line Breaker Control Device, arcing from heavy currents, ordinarily ruptured in the controller or overhead circuit breaker, is transferred to a high-speed line breaker under the car.

The whole secret is in the slight lost motion in the LB Control Device. When the controller is turned toward the "off" position, the cylinder does not move until the line breaker has done its work in rupturing the circuit.

Twenty-five hundred of these LB Control Devices are now in operation on seventy-five properties.

The G-E Line Breaker and LB Control Device are typical examples of G-E developments produced primarily to protect and save equipment.

330-44

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 7, 1927 *Number* 19

Long Live Will Livelong!

FOR 30 days and 30 nights the destinies of children, pedestrians and automobilists in the city of Philadelphia have been watched over and guarded zealously by a Safety Sage of wide repute, by name Will Livelong. The month of April was dedicated to the task of insuring greater street safety. Any such ambitious program as this is always a task, due to the apparent reluctance of the average human being to be concerned with the safety of himself and his fellow men while on the highways. Undismayed by the magnitude of the undertaking, a number of agencies in the city most directly concerned with the accident problem laid out extensive plans for conducting an intensive safety campaign.

To enlist the sympathy of the public and the man in the street there had to be an appeal to his sentiment and to his logic. In the safety campaign conducted in New York several years ago this appeal was made through the mythical character "Aunty J. Walker." The campaign just concluded in Philadelphia went a step farther. As recounted in this issue, the central figure was a kindly, wise old man dubbed "Will Livelong," the Safety Sage. Being an actual person, it was possible for the safety committee to stimulate much general speculation as to his identity, and to disclose it only at the end of the campaign. This interest was built up until, when April 30 rolled around, Mr. Livelong was probably the best-known and most popular character in the city. By ascribing all safety messages and slogans to the sage, the safety committee which directed the campaign was able to take all the sting out of the warnings and to place the educational work on a plane of friendly interest rather than one of officious interference.

Results obtained from the campaign were good. Philadelphia was ripe for a concerted effort such as this, coming just when the warm spring days brought thousands of automobiles out on the streets and induced a spirit of joyous and carefree abandon in the breasts of pedestrians, young and old. The coverage of the campaign was amazing when it is considered that only $10,000 was spent. This sum, of course, covered only materials and was not used to compensate the members of the safety committee for their long and arduous labors in the cause of safety. It shows what can be accomplished when the community backing of a worthwhile movement may be obtained.

It is interesting to note that it took more than 2½ weeks of concentrated effort to overcome the momentum of the ever-rising accident toll and to start the trend downward. In the final analysis such a campaign as this is of little economic value unless its effects are fairly permanent. Encouragement is seen in the decision of the various organizations most active in the April campaign to carry on the work of safety education throughout the year. The lovable old character, Will Livelong, will probably find himself much in demand in Philadelphia and elsewhere in the months to come. As things stand now, were he politically ambitious he probably could be elected mayor!

Should Government Ownership Propaganda Be Ignored?

SOME difference of opinion seemed to develop at the recent meeting of the Southwestern Public Service Association and the Southwestern Geographic Division of the N.E.L.A. as to whether or not the utility industry should actively take the field against the threatened campaign by a radical group in Congress for government ownership of utilities. Sentiment on the part of some in the meeting was that even by attacking it, recognition was given to what is at present only a nebulous attempt to organize a movement for government ownership. Others in the meeting advocated openly attacking political ownership—for that is what it amounts to—and exposing the motives of its proponents.

There is no fundamental difference of opinion between these two groups of utility men. They both agree on the need of crushing, as one would crush a rattlesnake, this sinister threat against the security of American business through undermining its foundation of private initiative. The issue at stake is greater even than the utility industry. Political ownership of utilities would be merely the first thrust of the unscrupulous seekers for self-aggrandizement into the heart of all American business. Light and power would be only the beginning. That is the logical starting point for these champions of the "peepul," because light and power is a young and growing industry. Its very achievements, which read almost like a fairy tale, offer the necessary appeal to popular imagination for building up the story of "grasping corporations." But others would feel the attack quickly. Next would come city transportation, railroads, telephones and telegraph, coal, steel and other basic commodities, and finally business itself. What is there in favor of political ownership of the one, compared with regulated private enterprise, that does not apply equally well to all basic services and commodities and then to all business?

Ridiculous on its face? Certainly. But nevertheless the threat of a government ownership campaign has been made and the utility faces the responsibility of forewarning the public in order that it may know how to deal with those who would feather their own nests while pretending to serve the country's interest. The question is when and how? The answer is immediately by every medium that is available for reaching the public. But a word of caution is advisable. There is no issue on government ownership in this country at the present time. There is no movement under way which is worthy of recognition as such. The utility story should be merely the facts of private ownership and operation. But the time to tell it is before an issue arises.

More Recreation Makes Better Railroaders

"WE DON'T keep bankers' hours in this office" was the boast of the old-time railway executive. Nowadays sentiments of this kind are voiced less frequently. This is not because transportation men today keep "bankers' hours," whatever they may be, but rather because the thinking of the industry has changed in regard to the proper relation between work and recreation.

After all, it is not the number of hours a man puts in that counts, but the amount of work that he accomplishes. Recreation, often confused with amusement, really means a renewal of energies. To offset the severe drain on his physical strength made by concentrated efforts, it is necessary that a man have recreation, that he be "re-created" from time to time. This fact is attested by scientists, teachers and physicians. It is constantly receiving wider recognition in the electric railway industry.

Moreover, recreation presents an opportunity for making more contacts with other people. In this respect the average railway man has been notably deficient in the past. It gives him a better understanding of what his neighbor is thinking—including his attitude toward the railway. The value of personal contacts and knowledge is inestimable.

The transportation business, of course, cannot be run always on a basis of regular hours of work such as prevail in many other industries. Storms, accidents and other emergencies are bound to occur, often requiring long-continued strenuous efforts by every one before the cars are again running smoothly. Under normal conditions, however, the transportation man ought to pause long enough from his work to take regular recreation. He should regard this not as a waste of time but rather as a vital necessity.

Parking Should Be Allowed —On Some Other Street

IN EVERY city the advocates of a general policy of liberal automobile parking regulations are legion. But they do not agree as to where parking should be allowed and where it should be forbidden. Each one favors it everywhere except in front of his own door. Theater patrons want to be able to park their automobiles close by. On the other hand, the man who lives near a moving picture house objects to having his own curb lined with the automobiles of strangers. Merchants desire to encourage automobile trade by liberal parking privileges, but they are opposed to any regulations that permit vehicles to block the approach to their own stores.

The absurdity of the position taken by some of the advocates of parking has seldom been more clearly demonstrated than during a recent hearing at Philadelphia. A prominent merchant appeared before the City Council in opposition to the parking ban in the downtown business district. He declared that the merchants in his neighborhood were practically unanimous in favor of automobile parking. He admitted, however, that some time previously he had asked the Police Department to place "no parking" signs in front of his own store. His explanation was that he did not think it practicable to permit parking in front of his particular store, but that he believed it should be allowed elsewhere.

As an isolated incident the testimony of this merchant before the Philadelphia City Council is rather ludicrous. But it betrays the existence of a situation that is far from ludicrous. Too many people are thinking about traffic problems in terms of their own personal convenience. No solution will ever be found by that means. Traffic and transportation are community problems that can be solved only by community thinking—the submergence of the individual in favor of the public.

How Are We Going to Accommodate Them?

BY THE year 2027 the world's population will have multiplied itself 32 times. Such is the astounding statement of Prof. A. E. Ross, the noted University of Wisconsin sociologist. In other words, Professor Ross predicts that in that year there will be 60,800,000,000 of the *genus homo* running all over the globe. According to this authority the population of the world has doubled in the last 90 years with a birth rate of 45 per 1,000 and a death rate of only 15 per 1,000.

While, of course, most of us won't have to worry about standing room in 2027, we will, on the other hand, have to watch our step as to what we must do in the next 25 years to transport these millions yet unborn.

Seriously, this is a new angle and at the same time a powerful argument for better transportation service. How are we going to accommodate these millions that are drifting toward this globe from the land of shadows? Unquestionably, they are going to require bigger and better and more de luxe transportation; that is, if the rapid change of tastes of this generation is any criterion. What is the solution? It rationally is new cars, better cars and an unceasing study as to how we can improve our construction practices in order not to be swamped by the human deluge.

Don't let us make the mistake of laughing up our sleeves at the professor, especially when we see how the fanciful flights of Jules Verne have become common realities today. When we are prone to plan for ten years ahead when we should plan for twoscore, let's remember that 2,635 years ago Nahum, the prophet, wrote, "The chariots shall rage in the streets, they shall jostle one against the other in the broad way. They shall seem like torches, they shall run like lightning." Possibly had he been heeded instead of razzed, the steam train and the automobile would have been developed centuries ago, and maybe—who can tell—there would be no such thing as a 30-ft. street or a traffic cop.

We have the handwriting on the wall before us. We must realize that super-transportation is knocking at our doors; that in the next decade we may have four-decked streets; that every railway right-of-way will be double decked; that street cars will be operated with dining car service between the home and office; that the gigantic influx of population will demand millions of street cars, taxis, buses, private cars and airplanes; that competition will engulf us if we do not build better track, better cars; if we do not plan and develop in the super sense. All about us are frontiers to which we must bring the thin but determined line of progress. It is a great task that Professor Ross' prediction outlines for us. It will take colossal energy and the unselfish co-operation of every man in the electric railway industry.

Let's Not Ride a Willing Horse to Death

NOTABLE progress has been made recently by electric railways in securing relief from paving obligations. Five states have enacted legislation lifting this burden from the shoulders of the car riders, and many individual municipalities have made similar agreements with the companies operating within their limits. In so doing the public authorities have taken a reasonable attitude, and have shown their willingness to meet the companies half way in the solution of the transportation problem.

Because a railway has been granted partial relief, however, it should not assume that it no longer has any paving obligation whatsoever. Some of the new agreements stipulate annual lump sum payments in lieu of paving. Sometimes the obligation is to pave only a narrow strip, or merely to maintain the track pavement. But in every instance where details are available, a certain measure of responsibility for paving continues to rest on the railway.

Scrupulous care must be exercised to see that the remaining obligation is carried out. Quibbling over details, resort to technicalities to postpone execution of the work, disavowal of damage actually resulting from car operation, will serve only to make public officials regret that relief was granted to that railway. Word of it will quickly reach other localities where relief from paving burdens is under consideration. The fair-dealing company in one city may thereby be prevented by the actions of a delinquent company in another city from securing just and reasonable relief.

The Politician Is Not So Bad as He Is Painted

NOT so long ago the public relations problem of a large railway had reached such an acute stage that it was simply impossible for the utility to come to an understanding with the city council on any large question involving its right to conduct business at a profit. A change in management became imperative.

Shortly after the change things began to hum. Civic organizations went on record as favoring the company's viewpoint, the newspapers called for prompt agreement and within a few months an overwhelming majority of the councilmen passed a series of ordinances that had been hanging fire and under fire for more years of bickering than these months of harmony.

What lay at the root of the former management's failure? Poor service, excessive fares or lack of civic interest could not be blamed. The fault lay in an attitude—a state of mind. The management kept proclaiming and declaiming that all politicians were crooks; that its motto was: "Millions for defense but not one cent for tribute." It fostered the belief that the only barrier between the company and the public was the politician's itching palm.

The sequel has proved that this attitude was due to a gross misconception of the average politician's point of view. Instead of assuming that the politicians were either crooked or stupid, the new management went on the basis that they were decent human beings who simply needed a man-to-man approach instead of a shower of brickbats. Painstakingly the wants of each district were studied in association with the councilmen. Then, when an agreement was in prospect, it was possible to give to these so-called politicians a very large degree of credit for the contemplated improvements in service.

Was the Umph Street line to be extended? Yes, through the untiring efforts and ingenuity of Aldermen Snibble, it was. Were five of the new soft-cushion seated cars to go on the Woof Avenue line? Sure, Alderman Waffle's arguments had not been in vain. Would transfers be given between the trolley and the bus routes? They would be, thanks to the clarion cry of "One City, One Fare" originated by Alderman Ginpeel.

Instead of calling the aldermen harsh names, the newspapers commended them; nor have we heard that any of these gentlemen were refused re-election because they voted for ordinances that actually allowed the utility to grow and prosper in the proportion that it helped its community grow and prosper.

Another Call to Join the Art Movement

WHILE arguments fly back and forth concerning the advantages or disadvantages of standardization in industry, an exposition of Art in Trade was held in a large Eastern city from May 2 to May 7 inclusive. As a result of this effort the movement for transforming commonplace things into objects of beauty has advanced a step further and will likely add to its roster many new adherents. Although the exhibit itself was directed more particularly to home furnishings and household utilities, its purpose embraced all industries in an alliance between the manufacturer and the fine arts.

Assuming that every railway manager as an individual has a dormant capacity for art, consider how broad and varied is his field for expressing it! Take the trolley car itself, formerly a mere mechanical contrivance for carrying people, but now a transportation vehicle, in the development of which no effort has been spared to combine beauty and utility. That manager has joined the industrial arts crusade who paints his vehicles artistically as well as economically, who is an unrelenting purist in the matter of car windows, who replaces the old-fashioned hideous posters with those of artistic design, enticing the riders to travel to the end of the line; who dismisses the agent slatternly in appearance and sluggish in response and replaces him with the neat, courteous and willing salesman. In numerous other details the alert railway manager has opportunities to inject art into his industry.

If he has been slow to accept the doctrine in the past let him get back of the movement now, for industrial arts today is on a plane with the fine arts. In the words of Robert W. De Forest, president of the Metropolitan Museum of Art, New York, addressing the recent exposition, industrial arts is no longer an orphan. Though much is to be said about the standardization of industry, the individual at heart has often been a Muse, although his capacity sometimes seems latent. May this latest effort sound the tocsin to arouse laggards to a realization that, whether the product be soap or railway service, consideration of the subject of industrial arts as a potent fact in every-day life can no longer be ignored.

"Make April Safe"

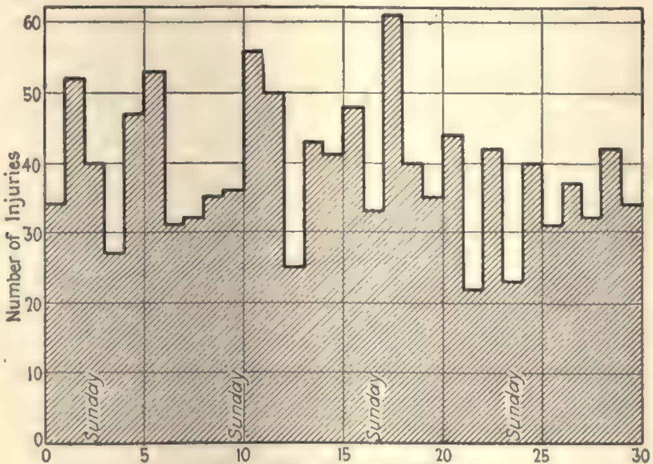
Was Philadelphia's Slogan

Under the genial sponsorship of "Will Livelong," the Safety Sage, an intensive month-long campaign was carried on to reduce street accidents—Enthusiastic support to the movement was given by all progressive elements in the community

SOMETHING out of the ordinary in safety campaigns was carried on during April in Philadelphia, when a real, flesh-and-blood character was used to typify the kindly old Safety Sage of a community movement to reduce street accidents. For a period of 30 days the quizzical glance of "Will Livelong" rested upon young and old, autoists and pedestrians, everywhere in the Quaker City. His common-sense advice and gentle admonitions were heard and seen by all but the deaf and the blind. As a result, Philadelphians were awakened to a degree of accident consciousness never before attained. Street fatalities during April, the "safety month," showed a decrease of 26 per cent from the number recorded for the same month in 1926. The rising tide of injuries was stemmed and, for a time at least, started downward once more. April was a month of intensive effort and of gratifying achievement.

Backed by the Philadelphia Rapid Transit Company, the citizens' safety committee of the Philadelphia Chamber of Commerce, the public schools, the automobile clubs, the Department of Public Safety, and numerous other civic bodies, the campaign got off to a good start on April 1. Prior to this, very definite plans had been laid out by the safety committee to carry the campaign through a number of distinct weekly phases during the course of the "safety month."

The first problem was that of finding a suitable character around which the warp and woof of the whole campaign might be woven.



Injury peak days and the general injury trend continued to rise until the eighteenth day, when a marked decline set in

By a happy inspiration the name "Will Livelong" was hit upon. To fill this rôle of a kindly old safety philosopher, an admirable choice was made in the person of W. F. Hogan, a venerable retired engineer, who, many years before, had been active in the construction of the cable and horse car lines in various sections of Philadelphia. From the very outset he was a popular and fascinating personage. No announcement as to his true identity was made until the very end of the campaign. That, however, only whetted the public taste and increased the popularity of the character.

Having established "Will Livelong" in the public eye as a character whose advice on matters of street safety was worthy of careful attention, the campaign committee proceeded with the various phases of the month's drive, always using the Safety Sage as the mouthpiece for any and all slogans and messages which were to be presented to the public.

As street accidents may roughly be divided into three general classifications, those involving children, pedestrians and general vehicular accidents, it was decided to assign a full week to a specific drive on each of these prolific sources of casualties. After a two-day introductory period, the month was divided as follows:

April 3 to 9—Children's Safety Week.

April 10 to 16—Pedestrian Safety Week.

April 17 to 23—Automobile Safety Week.

April 24 to 30—A period for warring on all forms of street accidents in which to perpetuate the safety work throughout the year.

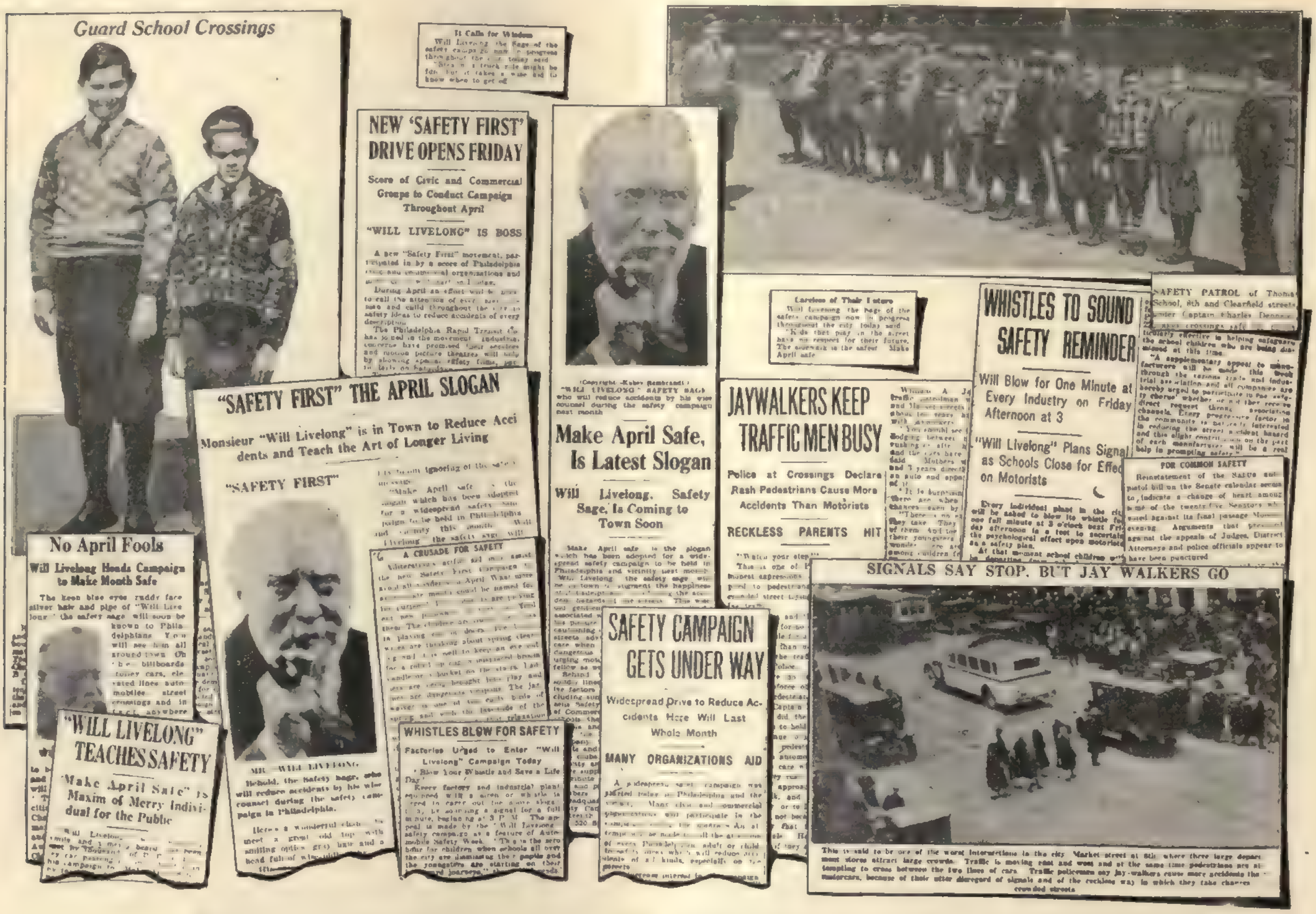
During the introductory period of two days efforts were made to line up every possible factor in the community which might be persuaded to assume some part, great or small, in helping to put over the campaign. Letters were sent to more than 250 clubs in the city asking that resolutions be voted indorsing the movement and pledging the active participation of the groups and of their individual members in the city-wide effort to reduce the street accident hazard. A meeting of newspaper representatives from the large city dailies was called and plans for the campaign were discussed with them in detail. In addition, some forty community and foreign language papers were contacted with and asked to give their full support to the general campaign, as well as to undertake a more localized drive among their own readers. It might be said here that the backing given to the safety movement by the press, particularly by the smaller community and foreign language papers, was more than gratifying.

The seven broadcasting stations of Philadelphia and station WCAM in Camden also gave unstintedly of their time "on the air" to speakers furnished by the safety committee. Equally gratifying was the assistance rendered by the moving picture and legitimate theaters. Advertising space in the programs was donated by the companies and many of the theaters used safety slides on their screens.

Each year the accident toll in Philadelphia had risen and there appeared to be real need for a concentrated effort to make the people "accident conscious." The Philadelphia Rapid Transit Company, which conceived the idea, realized, of course, that far more comprehensive results could be obtained from such a drive if it were sponsored and participated in by every factor in the community, which was directly concerned in the street accident problem, than would be possible if it were undertaken by one agency. Therefore, while the campaign was financed largely by the transportation company, an appropriation of $10,000 being set aside for this purpose, and while a major portion of the actual work of conducting the campaign was done by members of the P.R.T. organization, the company itself figured publicly only as one of the "co-operating bodies." Special letterheads were prepared, carrying the names of the principal organizations which were active in the work. Special "Will Livelong" Safety Campaign press release sheets were used in making announcements to the papers. Those employees of the transportation

A reception was held in the Mayor's office. From left to right are Fred W. Johnson, chairman of the citizens' safety committee; Mayor Kendrick and Will Livelong (W. F. Hogan)

Will Livelong was accompanied to the City Hall on the 29th by a guard of honor composed of Safety Patrol officers from the various Philadelphia schools



Guard School Crossings

It Calls for Wisdom

Will Livelong, the Sage of the safety campaign now in progress throughout the city, today said: "Stealing a truck ride might be fun, but it takes a wise kid to know when to get off."

NEW 'SAFETY FIRST' DRIVE OPENS FRIDAY

Score of Civic and Commercial Groups to Conduct Campaign Throughout April

"WILL LIVELONG" IS BOSS

A new "Safety First" movement, participated in by a score of Philadelphia civic and commercial organizations and ...

During April an effort will be made to call the attention of every man, woman and child throughout the city to safety ideas to reduce accidents of every description.

The Philadelphia Rapid Transit Co. has joined in the movement. Industrial concerns have promised their services and motion picture theatres will help by showing special safety films ...

(Copyright—Kubey Rembrandt)

"WILL LIVELONG" SAFETY SAGE who will reduce accidents by his wise counsel during the safety campaign next month

Make April Safe, Is Latest Slogan

Will Livelong, Safety Sage, Is Coming to Town Soon

"Make April safe" is the slogan which has been adopted for a widespread safety campaign to be held in Philadelphia and vicinity next month. Will Livelong, the safety sage, will be in town to augment the happiness ...

"SAFETY FIRST" THE APRIL SLOGAN

Monsieur "Will Livelong" is in Town to Reduce Accidents and Teach the Art of Longer Living

"SAFETY FIRST"

MR. WILL LIVELONG

Behold, the Safety Sage, who will reduce accidents by his wise counsel during the safety campaign in Philadelphia.

Here's a wonderful chance to meet a great old top with smiling optics, gray hair and a head full of wisdom ...

"Make April safe" is the slogan which has been adopted for a widespread safety campaign to be held in Philadelphia ...

A CRUSADE FOR SAFETY

WHISTLES BLOW FOR SAFETY

Factories Urged to Enter "Will Livelong" Campaign Today

"Blow Your Whistle and Save a Life Day"

Every factory and industrial plant equipped with a siren or whistle is urged to carry out the above slogan today by sounding a signal for a full minute, beginning at 3 P. M. The appeal is made by the "Will Livelong" safety campaign as a feature of Automobile Safety Week. This is the zero hour for children when schools all over the city are dismissing their pupils and the youngsters are starting on their homeward journeys.

No April Fools

Will Livelong Heads Campaign to Make Month Safe

The keen blue eyes, ruddy face, silver hair and pipe of "Will Livelong," the safety sage, will soon be known to Philadelphians. You will see him all around town. On the billboards, trolley cars, elevated lines, automobiles, street crossings and in fact, anywhere ...

"WILL LIVELONG" TEACHES SAFETY

"Make April Safe" Is Maxim of Merry Individual for the Public

SAFETY CAMPAIGN GETS UNDER WAY

Widespread Drive to Reduce Accidents Here Will Last Whole Month

MANY ORGANIZATIONS AID

A widespread safety campaign was started today in Philadelphia and the vicinity. Many civic and commercial organizations will participate in the campaign ...

Careless of Their Future

Will Livelong, the Sage of the safety campaign now in progress throughout the city, today said: "Kids that play in the street have no respect for their future. The sidewalk is the safest. Make April safe."

JAYWALKERS KEEP TRAFFIC MEN BUSY

Police at Crossings Declare Rash Pedestrians Cause More Accidents Than Motorists

RECKLESS PARENTS HIT

"Watch your step!"

WHISTLES TO SOUND SAFETY REMINDER

Will Blow for One Minute at Every Industry on Friday Afternoon at 3

"Will Livelong" Plans Signal as Schools Close for Effect on Motorists

Every individual plant in the city will be asked to blow its whistle for one full minute at 3 o'clock next Friday afternoon in a test to ascertain the psychological effect upon motorists of a safety plan.

At that moment school children will be departing from school ...

SAFETY PATROL of Thomas School, 8th and Clearfield streets, under Captain Charles Denne ...

"A supplementary appeal to manufacturers will be made this week through the various trade and industrial associations and all companies are hereby urged to participate in the safety chorus whether or not they receive direct request through association channels. Every progressive factor in the community is naturally interested in reducing the street accident hazard and this slight contribution on the part of each manufacturer will be a real help in promoting safety."

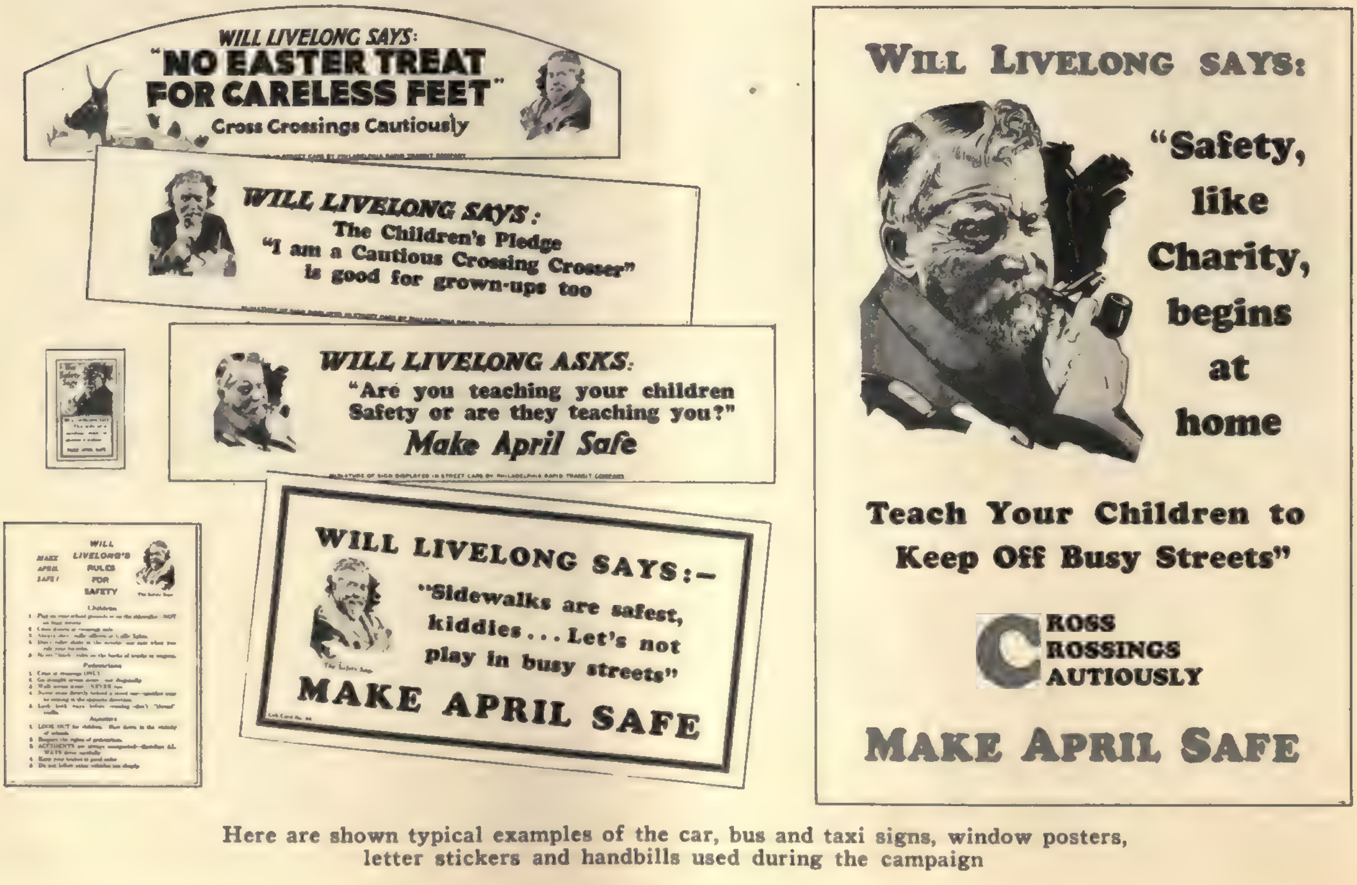
FOR COMMON SAFETY

Reinstatement of the Salus anti-pistol bill on the Senate calendar seems to indicate a change of heart among some of the twenty-five Senators who voted against its final passage Monday evening. Arguments that prevailed against the appeals of Judges, District Attorneys and police officials appear to have been punctured.

SIGNALS SAY STOP, BUT JAY WALKERS GO

This is said to be one of the worst intersections in the city, Market street at 8th, where three large department stores attract large crowds. Traffic is moving east and west and at the same time pedestrians are attempting to cross between the two lines of cars. Traffic policemen say jay-walkers cause more accidents than motorcars, because of their utter disregard of signals and of the reckless way in which they take chances ... crowded streets.

Hearty co-operation was given by the Philadelphia press, many stories and editorials similar to those shown above being used. The foreign language and smaller community papers were particularly helpful


WILL LIVELONG SAYS:
"NO EASTER TREAT FOR CARELESS FEET"
Cross Crossings Cautiously
WILL LIVELONG SAYS:
The Children's Pledge
"I am a Cautious Crossing Crosser"
is good for grown-ups too
WILL LIVELONG ASKS:
"Are you teaching your children Safety or are they teaching you?"
Make April Safe
MINIATURE OF SIGN DISPLAYED IN STREET CARS BY PHILADELPHIA RAPID TRANSIT COMPANY
MAKE APRIL SAFE!
WILL LIVELONG'S RULES FOR SAFETY
The Safety Sage
Children
Pedestrians
Motorists
WILL LIVELONG SAYS:—
"Sidewalks are safest, kiddies . . . Let's not play in busy streets"
The Safety Sage
MAKE APRIL SAFE
WILL LIVELONG SAYS:
"Safety, like Charity, begins at home
Teach Your Children to Keep Off Busy Streets"
CROSS CROSSINGS CAUTIOUSLY
MAKE APRIL SAFE

Here are shown typical examples of the car, bus and taxi signs, window posters, letter stickers and handbills used during the campaign company whose time was devoted almost wholly to the work of the safety campaign were in a sense temporarily divorced from the company and were simply a part of its contribution.

Representatives of the various participating bodies spoke frequently from the different radio stations and were invaluable in lining up still other organizations behind the campaign, so that it took on the aspect of a rolling snowball, ever increasing in size and momentum.

What P.R.T. Did Within Its Own Organization

At the outset of the campaign the transportation company undertook an intensive drive within its own ranks, with a view to reducing to a minimum the total of car and bus collisions during the safety month. Its officials addressed groups of employees at the various carhouses and bus garages for several days, until complete coverage had been obtained. A special issue of the employee organ, the *P.R.T. Co-operator*, was distributed among the 12,500 men and women of the organization. In it appeared a number of safety articles. Coverage in the Yellow Cab Company organization, also operated under Mitten Management, was secured through a special safety supplement of the *Yellow Age* and by safety talks and special cab cards bearing sayings of the Safety Sage.

Probably the most widespread medium of publicity used in the campaign was the carrying of dash, bulkhead and ceiling rack signs on all of the street cars, dash signs on the buses and various types of signs on the subway-elevated cars and on the station platforms. Thus the picture of Will Livelong and his various messages were carried into every section of Philadelphia and into many of the outlying communities. They were seen by literally millions of people, and also, of course, had a distinct psychological effect upon the P.R.T. employees as well.

Safety posters were used on all of the company bulletin boards. Weekly reports on the per cent reduction in car collisions were also posted, so that the men might know what results were being shown by their own efforts.

As a result of this intensive work inside the company, an excellent record for reductions in car and bus accidents was established during April. There were fourteen less collisions in April of this year than there were in the same month in 1926. This was a reduction of approximately 30 per cent.

Fleet owners who operate large numbers of trucks were urged by the citizens' safety committee to conduct safety educational campaigns among their drivers, since a large proportion of vehicular accidents occur through the carelessness of non-owner drivers. Many companies, thus solicited, co-operated very effectively in the work.

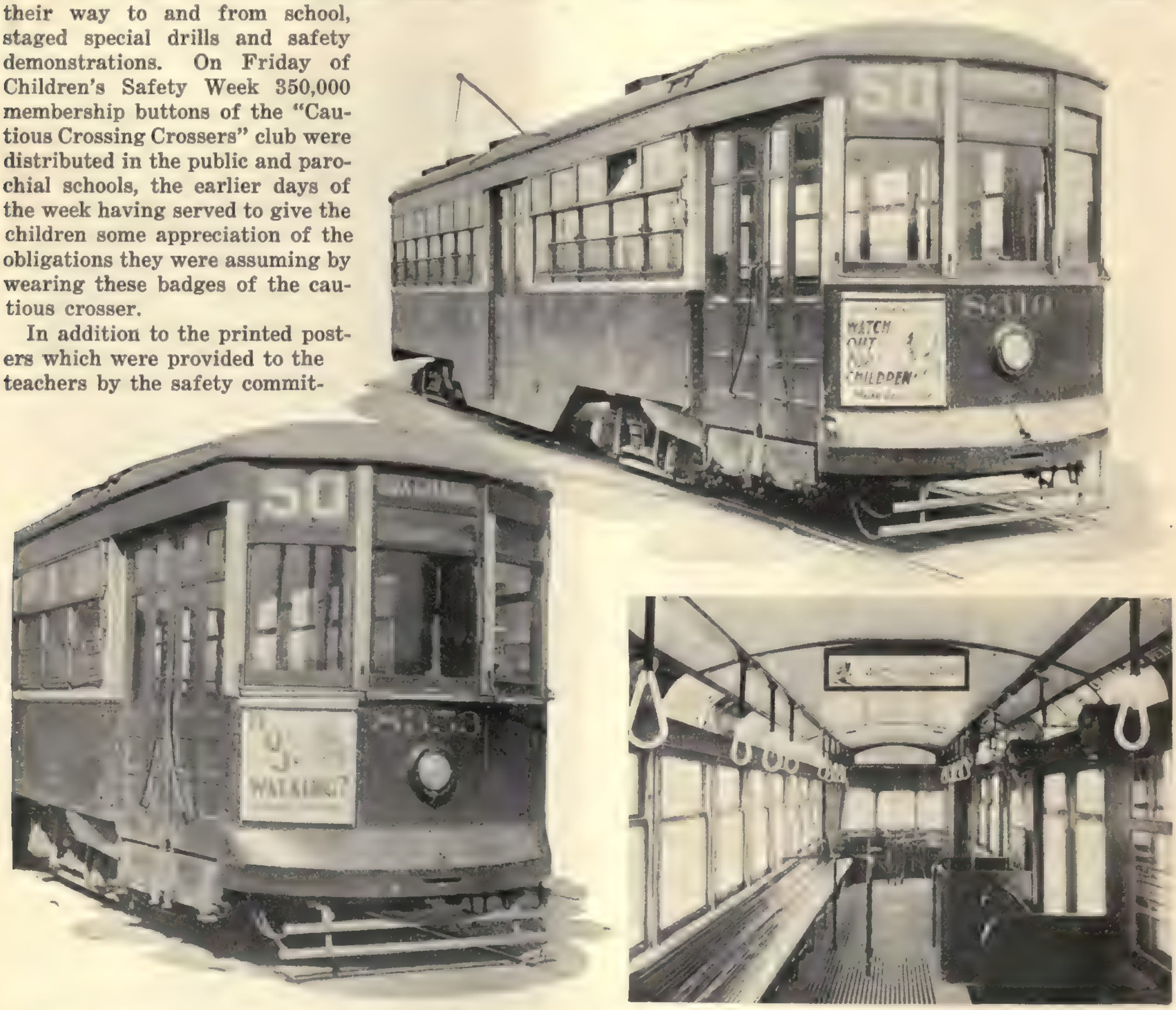
Left and above—Pictures such as these were used in the papers and in the schools to show children how not to play. At right—These two rubes, "Will Livelong's Country Cousins," distributed safety buttons and handbills on the downtown streets for several days

Children's Safety Week Activities

Through the whole-hearted co-operation of the public and parochial schools and the organized safety patrols, the attention of practically every child in the city was focussed on the matter of street safety during the week April 3 to 9. Talks by members of the safety committee were given before assemblies and individual classes in many schools. In the English, drawing and penmanship classes special emphasis was placed on exercises which would further encourage the observance of rules for safe conduct on the streets.

The Safety Patrols of the various schools, composed of picked groups of older boys whose duty it is to safeguard the street intersections while children are on their way to and from school, staged special drills and safety demonstrations. On Friday of Children's Safety Week 350,000 membership buttons of the "Cautious Crossing Crossers" club were distributed in the public and parochial schools, the earlier days of the week having served to give the children some appreciation of the obligations they were assuming by wearing these badges of the cautious crosser.

In addition to the printed posters which were provided to the teachers by the safety committee, pupils were encouraged to submit designs and slogans of their own, the best of these being sent in to the campaign headquarters and duly acknowledged by a representative of Will Livelong.



Dash, bulkhead and ceiling rack signs were used on all of the street cars and subway-elevated trains. With each weekly phase of the campaign the text of the signs was changed

Pedestrian Safety Week

During Pedestrian Safety Week, April 10-16, intensive efforts were made to reach as many individuals as possible among the Philadelphia public by means of radio talks, addresses before luncheon clubs and other groups, newspaper publicity and a widespread distribution of printed safety rules. These latter consisted of five specific rules for children's safety, five for pedestrians and five for autoists. Speakers before groups of business men took supplies of these printed rules with them, as well as safety window posters, and the business men were urged to make use of this material among their patrons to as large an extent as possible. Eighteen thousand window and bulletin board posters and more than 50,000 printed safety rules were distributed during the month.

All of the street cars and buses of P.R.T. carried dash signs bearing the slogan "'R U J Walking?' asks Will Livelong." Since the foolish actions of J-Walkers are sins of the individual rather than of the group, as is of course true of children's and automobile accidents as well, the appeal to avoid pedestrian accidents was directed wholly at the individual. He was reminded that he is endangering the happiness of his dear ones, as well as his own well-being, by taking unnecessary chances on the streets.

Automobile Safety Week

During this week the Keystone Automobile Club and the Automobile Club of Philadelphia were particularly active in bringing to the attention of their members the appalling toll of vehicular accidents in Philadelphia and throughout the country. The point was emphasized that a very large proportion of these accidents might be eliminated by exercising proper care in operating vehicles, by according ordinary road courtesy to the "other fellow" and by sacrificing a few moments of time in order to safeguard not only the driver but also all other users of the highway.

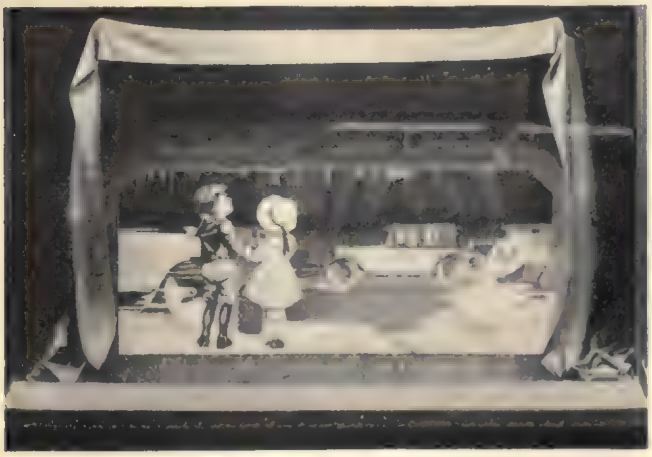
As an attention-attracting stunt two men dressed as rubes and plainly labeled as "Will Livelong's Country Cousins" distributed "Cautious Crossing Crosser" buttons and the printed safety rules throughout the center of the city for several days during the week. These men also attended the opening ball game at Shibe Park between the Athletics and Yankees, as well as the game on the day following, and distributed large quantities of safety material to the thousands of fans present.

Friday, April 22, was designated as "Blow-a-Whistle-and-Save-a-Life Day." Requests were sent to 3,600 factories and industrial plants in and around Philadelphia asking them to blow their whistles or sound their sirens for one minute at exactly 3 p.m. on this day. The purpose of this "safety chorus" was to remind the autoists of the thousands of children being dismissed from their schools at this hour, and to remind the children to exercise the necessary care while crossing streets. An excellent response was made by the various industrial plants and very favorable comment was received from the press and from individuals who wrote in to express their interest and sympathy with the movement.

FINAL WEEK

As an opening gun in the closing week, Sunday, April 24, was designated as "Safety Sunday." All members of the Philadelphia clergy were requested to mention the subject of street safety from their pulpits on this day. Bible classes, young people's organizations and similar discussion groups in the churches were also asked to give consideration to the problem of insuring to a greater degree street safety. So interested were the ministers that a number of them requested information concerning the procedure to be followed in establishing Safety Patrols in their church schools as an extension of the excellent work carried on by the public school patrols.

With a view to building up public interest in the announcements of Will Livelong's real identity on April 29, all radio talks and other talks before clubs and groups of children during this week were worded to stimulate curiosity on this point. It was announced that Will Livelong's 74th birthday would be celebrated on April 30 and all were urged to show their appreciation for his work in making the streets safer by sending him birthday greeting cards. A large number of these cards were received, showing that Philadelphians generally were glad to do him honor upon this auspicious occasion.



Many different types of window displays were used in store windows to emphasize the safety idea

Cuts, electros and mats such as these were sent to the co-operating newspapers. More than 350,000 of the buttons were distributed

On Friday, April 29, Will Livelong made his first public appearance when he called at the City Hall to meet Mayor Kendrick. He was escorted there by a guard of honor, composed of Safety Patrol officers from various of the Philadelphia schools. Representatives of the various co-operating bodies were also on hand at the reception by the Mayor and they were officially thanked for their contributions of time and effort in helping to put over this community movement.

April 30, the closing day of the Safety Campaign, was also the opening day of Boy Week. The activities of the two movements were to have been smoothly merged by having 250 safety banners and signs carried by marchers in the Boy Week parade. A driving rain on the 30th made it necessary to postpone the parade until the following Saturday, May 7. However, the safety banners and signs were to be used just as had been planned for the earlier date. As a further tie-in between the Safety Campaign and the Boy Week activities dash signs on half of the street cars and buses during the closing week of the Safety Campaign bore pictures of a typical boy and the phrase "Boy Week April 30-May 7, Be His Pal. Will Livelong says: 'Keep Him Safe.' "

A tie-up in another direction was made with Clean-up Week. The other half of the cars and buses carried dash signs which stated " 'Rubbish Causes Accidents. Clean Up,' says Will Livelong."

GENERAL PUBLICITY FEATURES OF THE CAMPAIGN

Safety stickers carrying a picture of Will Livelong, the Safety Sage, and the phrase "The wife of a careless man is almost a widow. Make April Safe" were printed in large quantities and distributed to hundreds of stores and other business firms throughout the city for use on their outgoing mail and packages during the month. Press releases, mats of safety cartoons and electros of Will Livelong's picture were sent to newspapers, house organs and local magazines. The Stanley Company of America and other news reel companies sent photographers to the safety demonstrations and to the Mayor's reception to Will Livelong. These pictures were shown in the downtown and community theaters and added much to the interest of the campaign. The *Evening Bulletin* ran a daily series of sayings by the Safety Sage and the other papers also co-operated quite extensively by means of news stories, editorials and photographic displays. The city of Philadelphia did its share by supplying radio and school speakers and by instructing its police officers to be particularly vigilant in insuring the safety of all users of the highways during the month.

DEFINITE RESULTS FROM THE CAMPAIGN

As shown in the chart on page 806 the trend of the accidents during the first 2½ weeks of the campaign continued slowly to rise. Following the two preliminary days, the toll of injuries for the four weeks was 265, 299, 277 and 239 respectively for the four weeks of the campaign. Following the high record of the second week, the reduction in the third week was in sharp contrast, but the number of injuries in the fourth week was far below previous records. It is significant that so long a time is required to arrest this ever-mounting accident toll by even the most concerted of efforts on the part of the whole community. The peak occurred on April 18. Then the trend took a downward path, and it is probable that this continued decrease in street accidents will continue for some length of time after the close of the campaign proper. In the matter of fatalities, as well, the record achieved during April was exceptionally gratifying. From a total of 30 fatalities in April, 1926, the number was reduced to 22 for the same month this year.

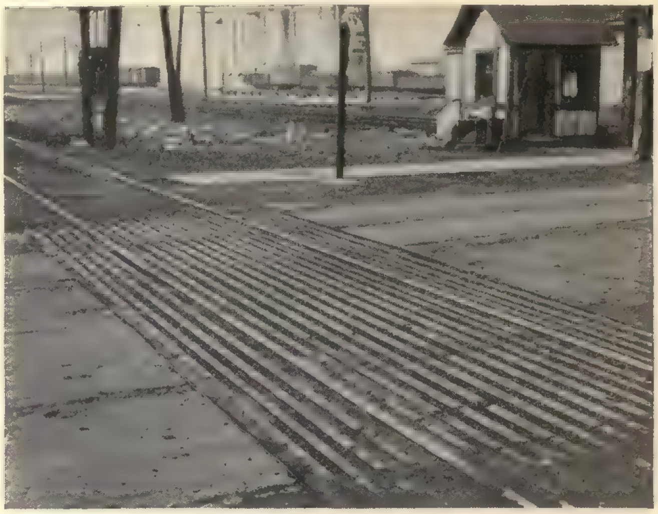
Durable Highway Crossing Made of Old Rail

By S. CLAY BAKER
Engineer Maintenance of Way East St. Louis & Suburban Railway
East St. Louis, Ill.

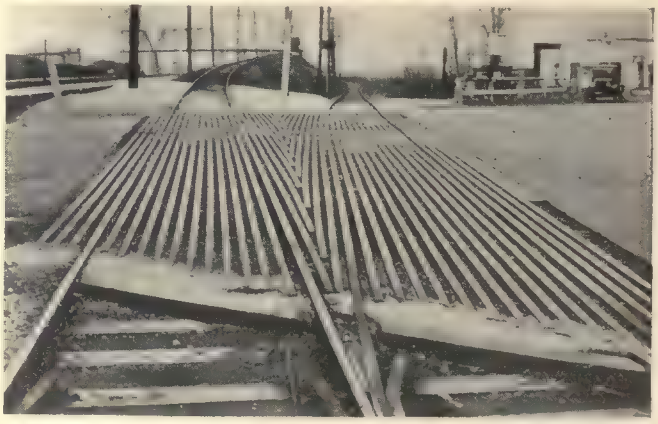
WHERE state highways and other heavily traveled routes intersect the lines of the East St. Louis & Suburban Railway a great deal of trouble has been experienced in maintaining suitable crossings. During the days of light vehicular traffic, the old-style plank crossing or track filled with fine macadam was satisfactory. Provided frequent inspections and repairs were made the plank had a long, useful life. A macadam crossing was economical and serviceable, although it required frequent inspection and refilling.

Since the advent of heavy automobile traffic, however, the life of a plank crossing has been substantially shortened. Moreover, good quality plank has become scarce and expensive. The macadam crossing nowadays requires constant attention to be kept filled. With either of these types it is difficult to maintain a smooth riding crossing and avoid complaints from automobilists resulting from broken springs, etc.

To solve the problem thus created brick and granite paving were installed at some intersections between the rails and outside the rails to connect with the highway pavement. These types are expensive and it has been found difficult to make a satisfactory installation with the T-rail used. Finally, it was decided to construct a crossing of old T-rail of the same height as the running rail. In building this crossing the track was brought to grade about 1 in. above the surface of the concrete pavement. Lengths of old rails were then set on the ties between the running rails and outside of them. They were placed as close together as possible, leaving space only for spikes between. After this had been done the spaces between the rails were filled with fine macadam. This type of crossing is somewhat more expensive than the types formerly used, but after completion requires practically no maintenance. It is favored by the highway officials. Two crossings of this type have been in use for two years and have given satisfactory service.



Standard right-angle highway crossing along the lines of the East St. Louis & Suburban Railway. Old T-rails in 30-ft. lengths were laid on the ties between the running rails. The intervening spaces were filled with fine macadam



Acute angle crossing at a junction of two heavily traveled state highways was built by cutting and beveling the old rail with an acetylene torch

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Co-operates in Improvement Work

THE Puget Sound Power & Light Company, Olympia, Wash., is removing all poles from the main downtown streets to alleys and side streets. The company is also co-operating with the city in paving streets between its tracks, although its franchise with the city does not call for paving. More than $50,000 has been spent in paving.

Determination of

Ton-Mile Freight Cost

By A. B. Cole
Commercial Consultant, Pittsburgh, Pa.

Factors to be considered in rate making. Analysis of the units of cost in electric freight transportation. Consideration of principles for allocation of expenses between passenger and freight operating service

WHAT is my ton-mile cost? No doubt this question has come up from time to time in the mind of practically every electric railway freight operator in the country. It is an important operating fact which he should know in order to determine correctly and intelligently whether or not his freight operation is paying.

With the modern methods of electric railway accounting in use, practically all data for determining the ton-mile cost may be found in the files of the public utility, when supplemented by the intimate operating knowledge of the official in charge. It is the intent of this article to outline the procedure followed in determining the ton-mile cost on an electric railway property, as well as especially to emphasize the important operating elements involved. While these latter may at first seem known to all, the interpretation given in this article is to bring out particularly certain operating fundamentals.

Transportation, as we know it, is well defined in the words quantity times distance, as expressing the work done, or

Transportation = Quantity × Distance,

and since we have two kinds of transportation we have

Freight Transportation = Tons × Miles

and

Passenger Transportation = Passengers × Miles

The basic units for transportation, then, are the ton-mile and the passenger-mile, and while each is a true measure of the kind of transportation to which it refers, neither of its individual factors alone is a measure.

It is in these units, fundamentally, that transportation is sold to the public, but in the case of freight transportation, the sale is expressed in a slightly different manner.

The average revenue ton-mile is an exceedingly variable unit, when one road is compared with another, and even on the same road when the record of one year is compared with that of previous years. This last statement is particularly true when we consider the factor which determines how the ton-miles may vary in an infinite number of ways. This factor is the kinds of commodities offered for transportation. They are almost innumerable, and each kind of commodity could have a rate of its own at some time or other. Of course, the number of classifications is being constantly reduced wherever possible, but a uniform classification, while used by some electric railways, is not only impracticable, but impossible from the standpoint of good business.

The first consideration in rate making is the character of the freight to be handled, and this in turn means a charge according to its value, and particularly all that a specific traffic will legitimately and fairly bear. Thus, in rate making, we have to consider:

1. Cost of service to perform the work required.
2. The competition present.
3. The value of the service performed, as compared with the value of the freight to be handled.

The all-important question of fixing transportation prices is usually determined by two or all of these factors, one of them being dominant at one time, and another factor at another time.

While carload freight is a very desirable kind to handle, the profit of such business depends obviously on the commodities to be transported in bulk.

The electric railway is an important carrier of short-haul and less-than-carload freight, and this class of traffic brings a higher rate than the same freight offered in carload lots. This less-than-carload service involves terminal expense and should pay more than service not involving such expense. Moreover, practically all electric railway freight movements are equivalent to express service at freight rates.

With the ton-miles unchanged, the average ton-mile revenue will be increased by anything that tends to decrease the number of large shipments and increases the number of small shipments of the same class of freight.

With character and quantity of the freight equal, it will be found that the transportation charge varies more or less with the distance an article is carried. Obviously, the longer the haul the greater the carrying cost per ton, but the additional cost does not vary directly with the additional mileage. Thus, interstate commerce is governed by the so-called long and short-haul clause which forbids a greater charge for a longer haul to the same point than for a shorter haul. Other things being equal, we find the charge per ton-mile will vary inversely with the length of haul.

Therefore, it readily may be seen that the revenue per ton-mile is the product of many variable factors, and in determining the cost of transportation, it is reasonable to assume that the rates or prices of transportation have been previously settled.

Running trains (one car or many) on a railway is the only way transportation can be produced. Thus, train-distance (train-mile) is the unit of transportation service done by a railway.

In practically no industry is the unit of service ever the unit of production. Thus, the ton-mile may possibly represent much more work done on one road than another or upon the same road at one time than another, and the energy necessary for its production is by no means constant. Thus, the unit of railway service must have factors corresponding with those in the unit of production, which have been shown to be

Tonnage or quantity × miles or distance.

But how is this tonnage or quantity obtained or carried? By a car or train, either single cars or motor cars and freight trailers, multiple-unit trains or cars hauled by a locomotive? All are conveyances of service. Therefore a good "unit of service" is provided by:

Conveyance × distance = train-miles.

Why should not the car-mile be considered as the unit of service? This is a logical question, since so much freight in many localities is carried by single-car trains. The car-mile cannot be used alone but must be converted into train-miles, which represents service done by:

1. Motor car or locomotive.
2. A definite number of trailers or freight cars, plus a caboose when used.
3. Train crew.

In producing the train-mile, the quantity of energy tends to be constant; while that spent per car-mile (where train or locomotive operation) does not vary considerably without any variation in the work done.

A large amount of preparatory work must be done on any railway system before the production of transportation begins. This usually is switching and making up trains in yards or at terminals, which may be called switching or work mileage to distinguish it from revenue train-mileage. Thus train-mileage is best measured by the number of miles train crews actually travel from point to point.

PRODUCTION OF TRANSPORTATION

Transportation is produced only when a railway makes revenue-ton-miles, for only then does it start to earn money. As previously indicated, a great deal of work must be done by a railway before it can begin to produce units of service, train-miles, and this work cannot be measured in train-miles. This work includes:

1. Terminal service and switching.
2. Maintenance of way.
3. Repairs to the entire railway plant (buildings, shops, machinery) and other items governed by different factors than those governing transportation.

From this, it will be seen that the unit of service, the train-mile, cannot be looked on as the complete unit of service, or possibly as a unit of cost. In each unit of service there are usually a great number of units of transportation, and the determination of the cost of these is very complicated, as it includes many factors that are not materially interdependent. Despite all of this, the whole theory of transportation depends on the cost per unit of transportation sold.

Since a railway performs work almost universal in character apart from the actual furnishing of transportation, there exists no opportunity to use a single "unit of cost" in the transportation business. Thus there are two main divisions of work done:

1. Revenue train-miles, and
2. Work preparatory and complementary to production of train-miles.

Therefore, the operating expenses may be divided into those (1) directly incurred by producing revenue train-miles; and (2) those not directly incurred. Thus it will be seen that the expenditures of an electric railway may be divided into four general classes:

A. Actual production of transportation, the unit of which is the revenue train-mile.

B. General direction, clerical work, and supervision, measured in per cent of total revenue.

C. Collection and handling of freight and passengers at stations, terminals and intermediate points, with the units, ton and passenger.

D. Maintenance and operation of the whole railway plant, not dependent upon the movement of trains. The unit for this class of expenditure is the mile of track.

After these are established, a division of expenditures between freight and passenger operation becomes necessary to determine the cost and profit of the ton-mile and the passenger-mile. Preferably this allocation should be made as the expenses occur. Where this has not been done previously, *A* and *D* may be divided according to train-mileage (where locomotives are used, "locomotive-mileage should be added); while the proper proportion between *B* and *C* depends on the relative amounts required by freight and passenger operation.

The next step is to apply to these expenses the units of cost already mentioned, thereby getting the following units for freight expenses: (1) Cost per freight train-mile, in cents; (2) cost in per cent of freight revenue; (3) cost per ton, in cents; (4) cost per mile of track, in dollars. In further considering the cost per freight train-mile, it must be remembered that this all-important unit is dependent upon: (a) Cost of power (delivered at the rail); (b) equipment maintenance; (c) maintenance of way; (d) train service, including supervision; (e) loss and damage.

IMPORTANCE OF TRAIN-LOAD

Thus it is evident that the most important element in the ton-mile cost is the relation between the number of ton-miles carried and the number of train-miles run, which means the revenue freight train-load.

The train-load is the supreme factor in determining the cost of the ton-mile, as well as the profit in the production of transportation. It thus becomes the one factor above all that makes for economical railway operation. The train-load determines a greater proportion of the ton-mile cost than all the other factors put together.

The train-load is governed by: Character of tonnage; condition of equipment; condition of permanent way, and vigilance of the management.

There are four important units of railway expenditures and an approximate method of properly prorating the expense between freight and passenger operation. From an electric railway report containing detail operating data it is possible to determine the principal units of cost. Thus a value may be found for the freight train-mile, for the handling of a ton of freight at stations and terminal points, for the maintenance of the fixed part of the whole railway plant or system and for the relation between general expenses and general revenue. The total of the ton-mile costs (in cents), of each, gives the average ton-mile cost for the whole system, as these figures would represent the average result of all business done by the electric railway.

It will readily be seen in the division of expenses that those under *B*, *C* and *D* are not necessarily affected by the ton-mile, and do not tend to uniformity of ton-mile cost, for there is only a very loose and general connection between the number of ton-miles carried and expenditures for maintenance of permanent way, buildings, etc., or between the number of ton-miles and the expenses at terminals, stations, etc., or between the number of ton-miles and administration expenses. But there is a general connection, predicated on the fact that a road needs so much plant (road as a whole) and so much general force to do about so much business.

As the ton-mile is a measure of revenue, and a road can afford to spend only so much for these last three classes of work, there should be approximate uniformity in the ton-mile cost for these items. Of course, in the train-mile expenditures, no such relation exists.

To effect economies in ton-mile cost in *B*, *C* and *D*, the expense must be considered by itself, apart from the ton-mile.

Generally speaking, money is not wasted by electric railways in manufacturing train-miles, but there is often a great deal of waste in the use of train-miles once they have been produced. Distinct recognition of this fact would produce a great saving on both electric and steam roads.

Therefore, in order that the electric railway man may estimate his ton-mile cost he should know:

1. Cost per average train-mile (expenses in *A* divided by the train-miles).
2. Average proportion of expenses in *A* to all freight expenses.
3. Average proportion of freight expenses to freight revenue per ton-mile.
4. Average proportion of empty car-miles.
5. Freight train density (ton-miles, divided by miles operated).
6. Train-loads (ton-miles, divided by freight train-miles).
7. Tonnage per car yearly.

What many electric railways operating freight service need to do is to increase the density of their freight business, in order to make the factors that are valuable in determining economies in ton-mile cost effective. For, as the density of business decreases, these factors become relatively less valuable, and as business is increased they tend more accurately to measure and regulate the cost.

It will be noted from what has been said, that after having established the four main units of railway expenses and allotting expenses between freight and passenger operation, this discussion has related primarily to freight operation. However, the same methods may be followed in determining the cost per passenger-mile, after the proportions in *A*, *B*, *C* and *D* chargeable to freight and passenger operation respectively have been determined. Thus, the units of cost in passenger expenses may be applied as follows:

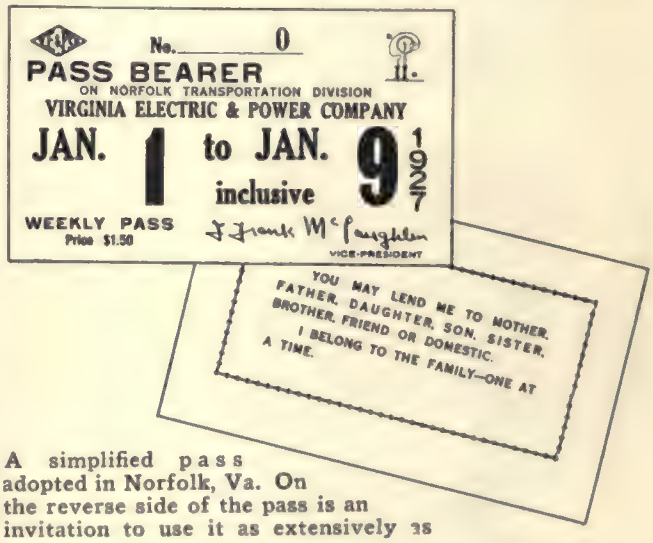
A = Cost per passenger train-mile in cents, based on the use of one or more cars per train.
B = Cost in per cent of passenger revenue.
C = Cost per passenger in cents.
D = Cost per mile of track in dollars.

Simplified Pass Form in Norfolk

SIMPLIFICATION of a weekly pass was accomplished by the Virginia Electric & Power Company, when this form of transportation was inaugurated for its Norfolk lines on Jan. 1 of this year. A complete reversal of the old policy of putting rules and regulations and restrictions on the face of transportation tickets has been effected. The first tickets, reproduced in the illustration, were printed in green on white ticket paper, except for the date reading "January 1 to January 9 inclusive," which appeared in red.

Instead of cluttering up the back of the ticket with restrictions and notices of penalties, there is a plain invitation to use the pass, written in the second person.

This pass, which sells for $1.50, is one of the three types of fares in use on the property, the two others being a cash fare of 10 cents and a ticket fare of 8¾ cents, four for 35 cents. This new fare schedule was started on Jan. 1, and supersedes the old fare of 6 cents on buses, 6¼-cent tickets and 7-cent cash fare on the cars. The zone fares existing prior to this last change have been eliminated and the entire system is now included in a single zone. The same fares apply to both buses and cars and transfers are given to passengers changing between them.



No. 0

PASS BEARER

ON NORFOLK TRANSPORTATION DIVISION

VIRGINIA ELECTRIC & POWER COMPANY

JAN. 1 to JAN. 9 inclusive 1927

WEEKLY PASS
Price $1.50

J. Frank McLaughlin
VICE-PRESIDENT

YOU MAY LEND ME TO MOTHER, FATHER, DAUGHTER, SON, SISTER, BROTHER, FRIEND OR DOMESTIC. I BELONG TO THE FAMILY—ONE AT A TIME.

A simplified pass adopted in Norfolk, Va. On the reverse side of the pass is an invitation to use it as extensively as possible

It will be noticed that the first pass is good for nine days, the extra two days included in the first period being necessary to reconcile the Sunday-to-Sunday pass with the fare change which took place on Saturday, Jan. 1. This was utilized as a "bargain day" feature to encourage buying the pass for the first week of its existence. The pass form is an evolution of that used first in Jacksonville.

Chicago Extends Construction of Concrete Loading Platform

Experience with Sample Installations Leads to Adoption of This Safety Feature as Part of Street Improvements—Bulkheads and Flashing Signs Add Safety

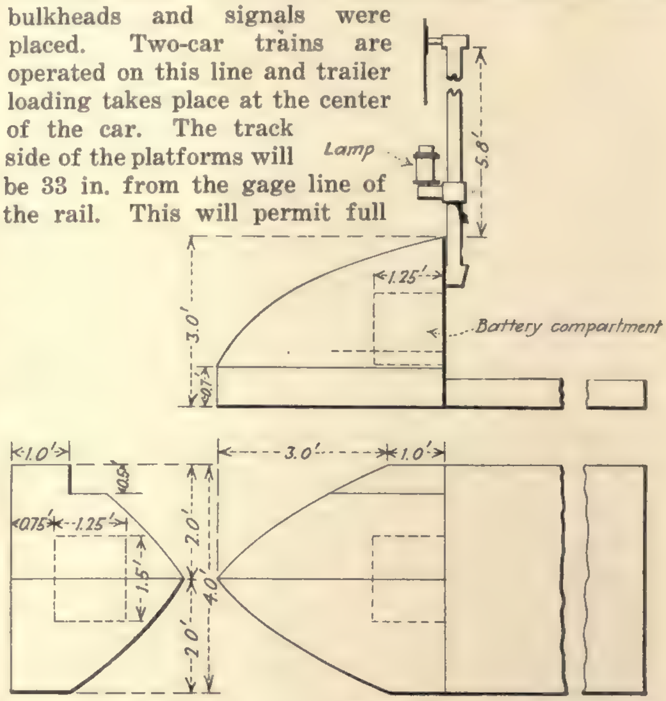
By L. M. Traiser
Special Traffic Engineer Chicago Surface Lines

SATISFIED with the first installations of concrete loading platforms on wide car line streets, the city of Chicago will include similar facilities for the convenience and safety of surface car riders in more than 7 miles of street improvement this year. These permanent loading platforms were introduced in Chicago last summer on more than 3 miles of street in two sections of the city.

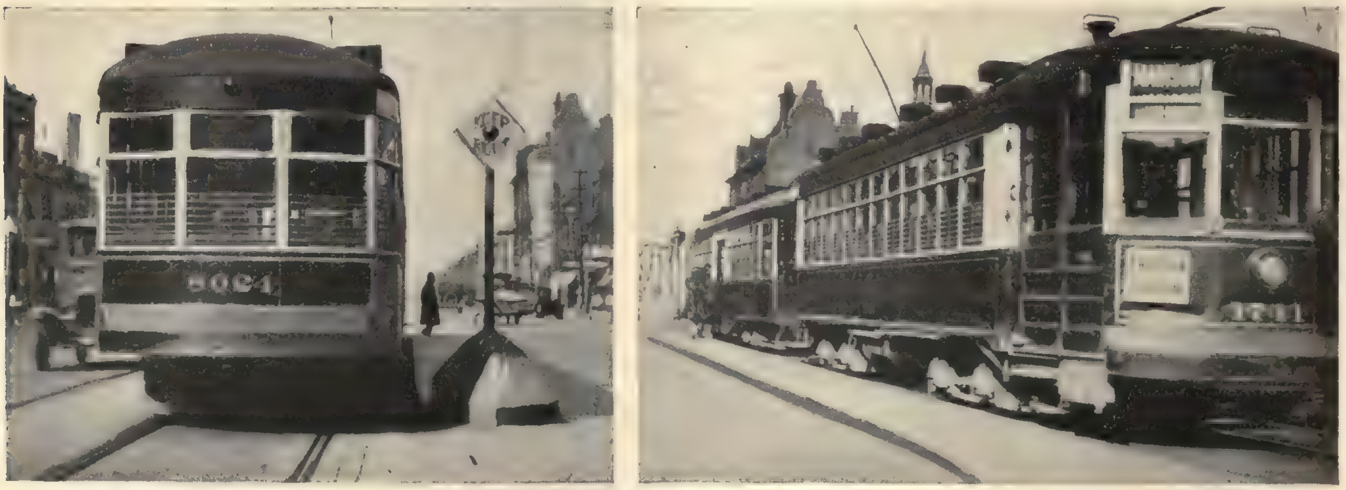
Eight months use has brought wide approval from both motorists and car riders. Vehicles can pass loading street cars and car riders are given protection while boarding and alighting. Elevation of the safety zone above the street level affords a clean, dry, walking surface. A platform width of 4 ft. permits easy movement to and from the cars.

The first group of these safety islands was built with ends sloping to the street level. At many locations on the up-street end of these platforms reinforced concrete bulkheads have been built and mounted with flashing "Keep to the Right" signs. Power for illumination is furnished by a battery located conveniently in the bulkhead and above the street level. With only slight changes, this measure of protection will be included at all locations, built according to the new design.

The accompanying drawing includes the principal dimensions of the platforms except over-all length. This has been determined by the type of equipment to be used on each line. Platform length of present and proposed installations is given in the accompanying table. Safety islands previously installed on West Madison Street were constructed 73 ft. in length at intersections where bulkheads and signals were placed. Two-car trains are operated on this line and trailer loading takes place at the center of the car. The track side of the platforms will be 33 in. from the gage line of the rail. This will permit full use of the loading zone without danger of being brushed by the moving cars.



A battery carried in a compartment in the end bulkhead is used to illuminate the concrete platform. The length of the structure varies with the type of equipment operated



Concrete bulkhead and flashing signs increase safety of Chicago loading platforms, which are long enough to accommodate a two-car train

DATA ON RAISED CONCRETE LOADING PLATFORMS IN CHICAGO

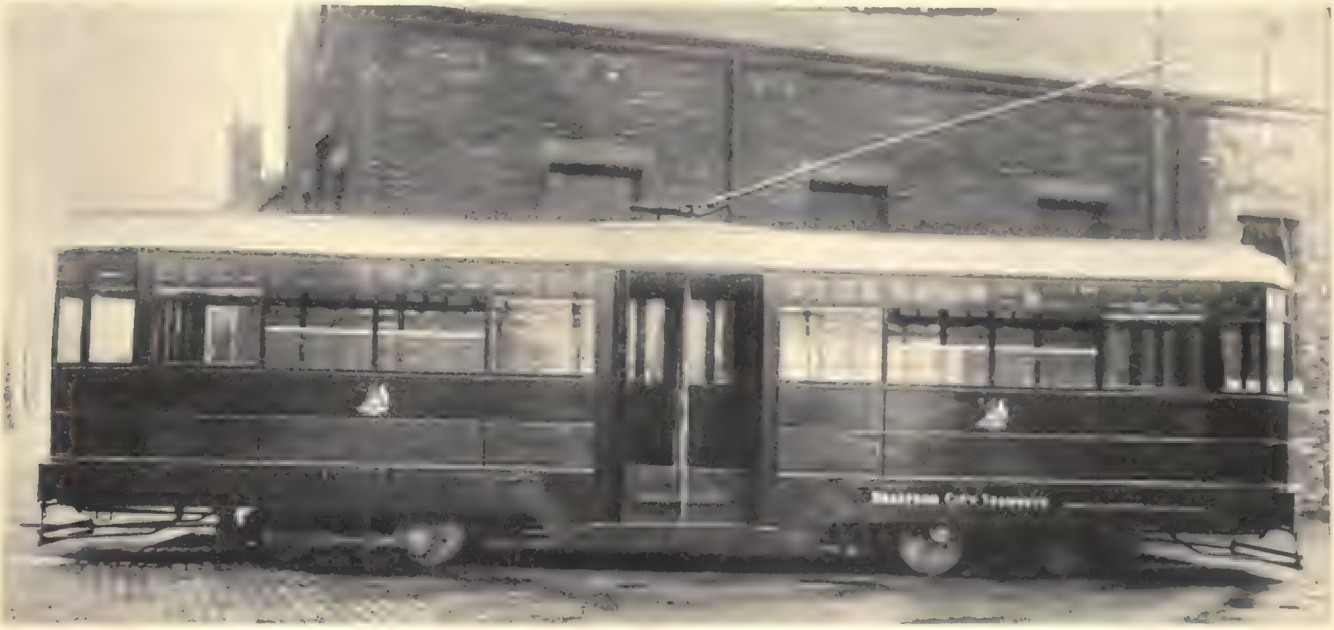
Car Line	Roadway Width, Feet	Number of Plat-forms	Length of Plat-forms, Feet	Bulkhead and Signal
1926 Installations				
Clark Street	94	13	70-80	Without
Madison Street	80	41	70-90	Part with and part without
To Be Installed (During 1927)				
Ashland Avenue	70	44	100	With
Western Avenue	70	31	100	With
South Chicago Avenue	60	11	100	With
Milwaukee Avenue	78	32	100	With

When built as a part of street improvements the first cost of these raised loading platforms is small, and when maintenance comparison is made they are expected to show economy over many types. This improvement has been designed by the Bureau of Streets of the city of Chicago in co-operation with the Chicago Surface Lines.

Acknowledgment of the important position and permanent nature of street railway transportation in Chicago is shown by this expenditure for platforms to give greater convenience and protection of street car riders.

British Car Designed for Quiet Operation

Single-deck, double-truck vehicle built at Bradford has two 63-hp. motors spring suspended from the car underframe. Remote axles are driven by propeller shafts



Bradford new worm-drive car with side guards removed to show connecting rods

PROGRESS in local transportation methods lately has been following two parallel lines in England. On the one hand there has been an extension of bus operation by the tramway managements, while, on the other hand, notable improvements have been made in rail car design. The latest step taken in this direction has been the construction of a high-speed, single-deck, worm-drive car for the Bradford Corporation Tramways.

Permission to undertake extensions of bus operations has been sought by more than twenty municipalities at this session of Parliament. Among the cities making application for wider bus use was Bradford, Yorkshire, the home of the woolen trade. Its application was the first to be acted upon by Parliament when, on March 3, it was turned down by a large majority.

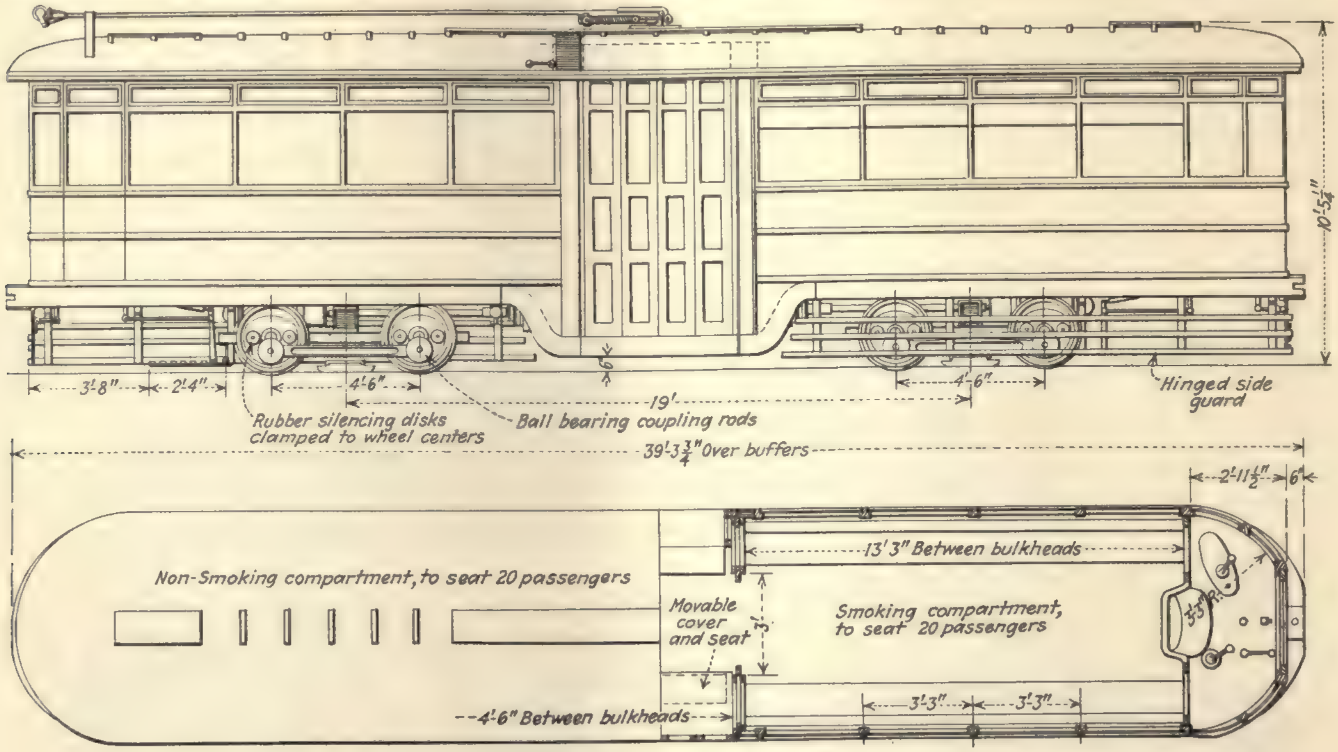
General Manager R. H. Wilkinson of the Bradford Corporation Tramways, however, had not put all his eggs into one basket. While the arguments for bus extension were being heard before Parliament, he designed and built a new type tram car with which to compete against the independent bus operators if the municipality was refused permission to operate its own buses. Like a good general, he chose carefully his time for springing this surprise. On the day preceding the parliamentary debate concerning buses Mr. Wilkinson startled the inhabitants of the city of Bradford by personally operating his new car on a trial run through the city.

The standard type car used on this system is a double-deck vehicle, rather noisy and slow. Thus the appearance of a single-deck car traveling at high speed with practically no noise was a genuine surprise. Yorkshire sat up and took notice. Newspaper men haunted the streets in the hope of getting a second view, for at first glimpse they had been too much surprised to snap the shutters of their cameras. Others called in a body at the Thornbury depot, where the car had been built, to get particulars. One and all were disappointed, however. It was not until some time later that the management was willing to divulge details concerning its construction.

The outstanding feature of the new car is the location of the two motors, spring suspended from the underframe. Each motor drives the remote axle of one truck through a flexible propeller shaft and worm gear. Wheels on the other axles of each truck are driven by connecting rods.

The motors are rated at 63 hp. and weigh 1,340 lb. each. This is only about 21 lb. per horsepower, a considerable reduction from usual British practice. The motors are series wound and specially designed by the English Electric Company to eliminate hum. Indications are that noise has been reduced to a marked extent. Dick-Kerr controllers are used, the only departure from standard practice being an arrangement for field shunting on the last notch.

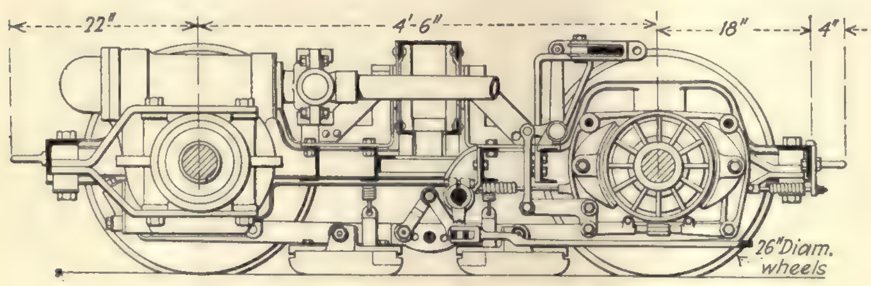
Connecting rods operate on ball bearings around the crank pins. Journal bearings are inside the wheels, which are of 26-in. diameter. The wheels are counterbalanced to prevent hammering on the rail on account of the eccentric weight. Axles are of high tensile strength steel, slightly tapered, as shown in an accompanying drawing.

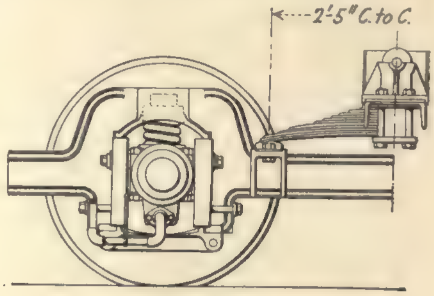


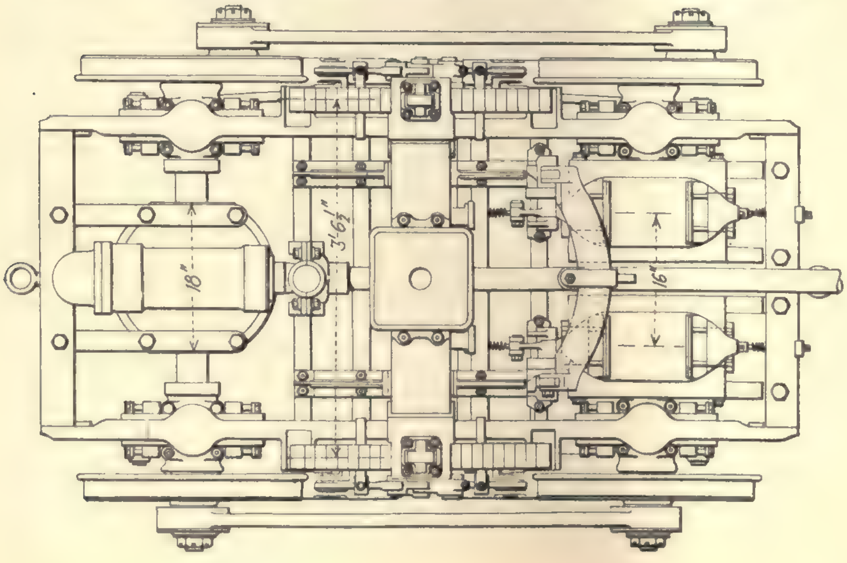
Single-deck, center-door arrangement of new Bradford car is a novelty in British tramway practice

The truck frame is of 8-in. x 3½-in. rolled steel sections. Trucks are spaced 19 ft. between centers. The wheelbase of each truck is 4 ft. 6 in. It has been found by experiments that the car can negotiate a curve of 29-ft. radius without difficulty. The drive from the motor to the axles is through a propeller shaft with Spicer universal joints at each end. The worm is of steel and the worm wheel of phosphor bronze. A gear reduction of 5¾ to 1 is provided.

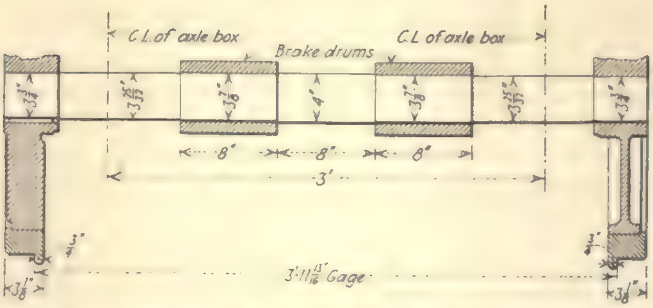
Spring arrangements are extremely simple. Each truck is equipped with two longitudinal semi-elliptic springs bearing on plain shoes. There is also one transverse spring, as shown in an accompanying drawing. Plain journal bearings with ordinary oiler pads are provided. Side thrusts are taken on a phosphor bronze washer between the wheel and the axle box. The center bearing consists of a rubber buffer, in the center of which is a phosphor bronze molding tube. The rub-







Above, details of semi-elliptical spring arrangement. At left, details of braking and driving mechanism



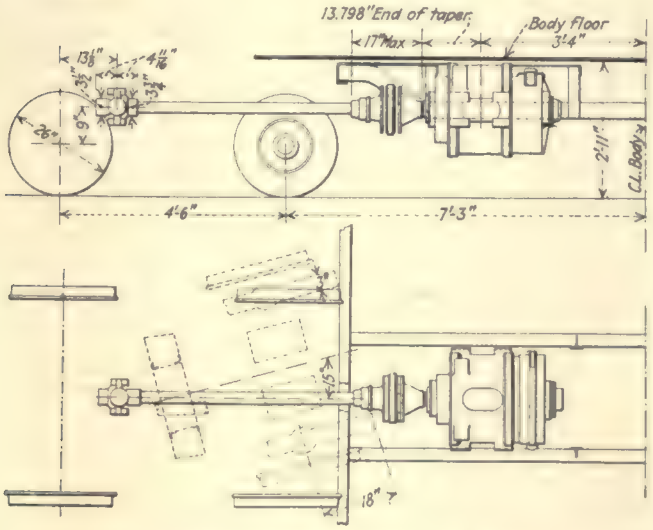
Assembly of inner axle showing brake drums which are placed in position before the wheels are pressed on

ber buffer cushions all shocks, while a loose phosphor bronze thrust washer at the bottom takes care of any downward thrust.

Straight air brakes are provided as well as hand brakes of the usual type. The air brakes are fitted with asbestos-lined shoes, pressing on two cast-iron drums mounted on each of the inner axles. This arrangement is shown in an accompanying drawing. For cooling purposes each brake drum has an interior vane. Eight outlets are provided for sand, one alongside of each wheel.

The length of the car is 39 ft. 3¾ in. over buffers. The width is 6 ft. 10½ in. at the belt rail and 7 ft. over the roof. Natural grain mahogany is used for exterior finish, while moldings, etc., are painted dark red. The roof is white. Entrance and exit are by means of double folding center doors. These are pneumatically controlled by the motorman and are interlocked with the control.

Three low steps give access to the center vestibule. The side members of the underframe are bent downward to form a well on each side. When the doors are closed hinged flaps drop into position at the floor level, making half of the vestibule always available for standees. Seats are provided for 34 passengers and it is estimated that 26 more can be comfortably accommodated standing. Seats are upholstered in red leather. The interior finish is mahogany. The ceiling is of birdseye maple finished in natural grain. Pale green linoleum covers the floor. Single-stroke bells operated at 500 volts are provided for communicating with the motorman.



The motor is spring suspended from the underframe and connected by a flexible propeller shaft to the outer axle. Dotted lines indicate position of wheels on the curve of 28-ft. radius

This is the first car of its particular type to be operated in Great Britain, although certain of the individual features are not altogether new. Single-truck cars with worm drive are in use in Halifax and Hull. Experiments have been made with single-deck cars in Glasgow and elsewhere. It is expected by the tramway management that the comfortable fittings of this car, its high speed and quiet operation will give it a popularity equal to or greater than that of its bus competitors.

Light Metal for Car Construction in Europe

EUROPEAN, as well as American, car builders are turning their attention more and more to the use of light-weight alloys in car building. There is no doubt that demand for the use of such materials in automobiles and their necessity in aircraft have assisted in the development of light-weight alloys and their use in car construction, where appreciable savings in power are gained with the reduction of every pound in weight of the car. From a review of the situation in Germany in a recent issue of *Verkehrstechnik* the following is taken:

There are now available two types of light-weight alloys, each of which has a distinct range of application: "Aeron," "skleron" and various modifications of "duralumin" represent the high-grade alloys, suitable for stamping, rolling and forging, with strength comparable to machine steel, and "silumin" and "cetal," which lend themselves to castings, but having only about one-half the strength of steel. Pure aluminum castings have only one-quarter of the strength of steel.

These alloys are from fifteen to twenty times more expensive by weight than steel, which makes it obvious that the ratio of material cost to finishing labor cost is of much less importance than with steel. Even if the alloys are used properly and the weight of a given piece is reduced to one-third or one-fourth of an equivalent steel construction the material cost is still six times as much. A very considerable reduction of the material is therefore essential. This can be accomplished with the high-grade alloys and relatively simple shapes to such an extent as to cut the over-all cost in half. Wherever possible, high-grade alloys should therefore be chosen, while castings are in order only for complicated pieces. Car framing members and panel sections call, therefore, for aeron or skleron, while hardware parts and fixtures should be made of silumin castings. The latter should be considered as an equivalent of steel castings or forgings, but it has the advantage of much lighter weight and the possibility to shape it by bending or rolling.

When the high-grade alloys are used as girders, closed U or box sections are recommended, and the sides of these members can be perforated with holes to save material. Beading the edges of these holes helps greatly to strengthen the girders. Attention must always be paid to the fact that these alloys are much softer than steel. A hammer blow will leave a much deeper mark, a key is more liable to work loose and come out, a bolt in an oversized hole will soon pound the hole to a much larger diameter where the structure is one subject to shocks, etc.

Nevertheless, by the use of these metals the weight of a 54-ft. steam railroad car was reduced to one-half of that of a steel car. Where steel or iron is also used a direct metallic contact between the alloys and the steel or iron must be avoided to prevent dangerous electrochemical destruction.

One of the greatest advantages of light-weight alloys is their much greater ability to absorb energy when subjected to shock. This is due to their small elastic modulus, which is only one-third that of steel, so that if a car, made substantially of these alloys, runs against an end stop, its main sills will compress lengthwise three times as much as if of steel. The impact energy, of course, varies with the square of the speed, according to the formula $KE = \frac{1}{2}mv^2$. To give a practical example based on a 15-ton alloy car, such a car operating at a speed of 14 m.p.h. can hit an end stop without more damage to the car than would be met by a similar steel car weighing 30 tons, at a speed of 6 m.p.h. Aluminum alloys are therefore about equal in strength to steel, but have a much larger capacity to absorb energy.

"Dress-Up" Day Sponsored by Cleveland Southwestern

With every motorman, conductor and station agent attired in a new uniform of dark gray whipcord, with gilded buttons, the Cleveland Southwestern Railway & Light Company, operating approximately 200 miles of track between Cleveland, Wooster, Mansfield and Bucyrus to the south, and Elyria, Oberlin and Wellington to the west, observed "Dress-Up Day" on March 31 as part of its general program for property and service improvement.

Realizing that a neatly dressed trainman is one of the best advertisements, the management of the company submitted a proposition to its employees whereby it would furnish one complete new uniform if the individual also would buy a complete uniform at the same time. This proposition was readily accepted by the trainmen. The idea of two uniforms is to insure that the employees will have a neatly pressed uniform at all times.

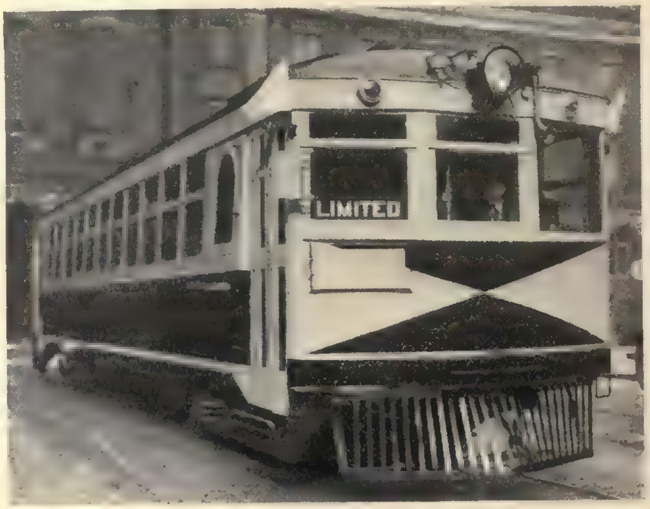
On "Dress-Up Day" many service stripes adorned the sleeves of trainmen on the line. Each stripe represented five years of service, and not a few trainmen proudly displayed as many as five gold service stripes.

In addition to this movement, headed by Frank H. Wilson, president of the company, the management has rightfully felt that the employees could not sell the service to the public unless they themselves were first sold. Thus by means of a series of meetings the problems and hopes of the management were laid before the men, who were quick to grasp the situation and organize as live salesmen for the Cleveland Southwestern company.

One of the many new moves to stimulate business is an arrangement whereby every ticket agent may earn a bonus each month. The business done at each station each month in 1926 is used as a quota basis for 1927, and the ticket agent and his force are paid a 5 per cent commission on all sales in excess of the quota.

Marked success has attended the putting into service of two rebuilt and redecorated light-weight interurban cars by the company. A color scheme of blue, ivory and yellow was worked out for their exteriors. The interior color scheme is in two restful shades of gray, with the floor covering of dark red linoleum. Bucket-type seats upholstered in taupe mohair and gray leather were installed. These seats were equipped with double cushions. Before placing the cars in service they were exhibited in numerous towns along the line and inspected by hundreds of people. In Cleveland, city and county officials and newspaper men were taken on a special trip, which was arranged so that the car would pass through downtown sections during the noon hour. Favorable comment was received from all sources upon the attractiveness of the cars.

This is not the first attempt of the Southwestern to improve the appearance of its cars. A de luxe parlor car service was inaugurated connecting Cleveland, Mansfield and Galion by the company about two years ago. The company's shops at that time rebuilt two cars for this special service, the cars being finished with the highest type of floor covering and seats, and the Pullman plan being followed in operating them, seats being sold from a diagram and passengers having the opportunity of making advance reservations. That this service was appreciated by the public is shown from the fact that during 1926 excess fare of $11,550 was paid by 32,000 passengers on these parlor cars.



One of the remodeled interurban cars of the Cleveland Southwestern Railway & Light Company which helped the company in its recent "Dress-Up Day"

During 1926 the company reballasted more than 60 miles of its tracks and overhauled 38 of its cars. A year prior to that the company purchased twelve new light-weight cars of the latest design to replace heavy and obsolete equipment. As a result there was a marked saving in every phase of operation. At the same time the company put its transmission lines into first-class condition, stringing more than 100 miles of new aluminum high-tension wire. In addition all bridges were rebuilt.

Owl Cars on "S" Line

The Los Angeles Railway, Los Angeles, Cal., has started operating owl cars on the "S" line on a 60-day trial basis. If the travel justifies, the service will be continued, according to R. B. Hill, superintendent of operation, and L. A. Racape, superintendent of schedules. Decision to give this service was reached after complaints from working men.

The Readers' Forum

Mr. Shoup Comments on Graham Articles and Bus Experience

PACIFIC ELECTRIC RAILWAY
SAN FRANCISCO, April 15, 1927.

To the Editor:

I have read with much interest articles in ELECTRIC RAILWAY JOURNAL of Feb. 26 and March 5 entitled "Fitting the Bus to Its Proper Place," by R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, and have noted your request for discussion thereof.

So far as the arguments and facts set forth by Mr. Graham with reference to his properties are concerned in the operations of urban transportation, and as they would apply to similar properties, there is little ground for discussion of the subject matter, as his exposition of facts and details relating thereto are very conclusive and convincing, and they have been beneficially applied to the Pennsylvania-Ohio Electric Company, but from experience of several years I am convinced that a large part of Mr. Graham's plan, as well as his deductions, would not apply to the urban transportation of the Pacific Electric Railway for the following principal reasons:

First—The transportation units of the Pennsylvania-Ohio Electric Company are of similar type, namely, Birney cars and single-deck buses, whereas urban service upon the properties of this company is performed by a variety of equipment, ranging from cars of the Birney type to that of steel interurban type, and for the further fact that in a number of instances both local and interurban service are operated over the same tracks.

Second—Mr. Graham is an exponent of the flat fare per ride, regardless of the distance to carry, which would probably be a satisfactory fare within the 3-mile single zone encompassed in his Youngstown situation, but we are convinced that price should be predicated upon distance traveled, and our operation in Los Angeles under that basis is satisfactory both to ourselves and to the public served, thereby overcoming (through the zones) to some extent, the lack of seat resale such as would be obtained by local lines operated through a metropolitan area where change of load and resale of seats was of more frequent occurrence.

PASADENA GIVES SOME COMPARISON

The only service we have comparable with that of the Pennsylvania-Ohio Electric Company in Youngstown is in the city of Pasadena, where we are operating a unified rail and motor coach service, Birney cars and 25-passenger White coaches. The same fare is charged on both carriers, with a general interchange of free transfers. Pasadena has a population of approximately 75,000. Every line, whether bus or rail, commences in the center of the city, and in some cases, particularly on East Colorado Street, the coaches parallel the rail service for a considerable distance. Both the buses and cars, as well as the tracks on which the cars operate, are in first-class shape. Our experience in Pasadena is much the same as found by Mr. Graham, in that the choice between the rail and the bus is mostly a matter of convenience to the passenger. Elderly people prefer the buses due to the fact that they pull up to the curb. Among the middle-aged and younger folks there is probably a slight preference for the street cars.

We are operating about 39 Birney cars and about 50 coaches in the Pasadena service. The primary motive for the establishment of bus lines was that a number of rail lines in that city had reached the point where they had to be rebuilt and large expenditure in that connection was not justified from the revenue received. In other cases additional service was necessary owing to the development and extension of the city. The rail lines which were worn out and for which bus service was substituted were not making net earnings and are not at this time, under bus operation, showing net revenue. Service upon such routes, however, is a necessary part of the local transportation plan in Pasadena.

OPERATING COST OF BUSES AND CARS IDENTICAL

Our experience in Pasadena is that we are operating 32-passenger Birney-type cars in rail service with practically the same cost as the 25-passenger White buses, and this comparison includes every item of expense—operating expenses, taxes, depreciation and interest on investment. The traffic, however, on the rail service routes is much heavier than on the motor coach routes; in other words, the motor coaches cover the lighter traffic lines. At the present rate of fare, namely, 7 cents, with eight tickets for 50 cents, the rail service is operated profitably, about or perhaps a little more than offset by the losses in the motor coach operation.

The Pacific Electric operates no special service on bus lines such as is contemplated by Mr. Graham, and which would be "de luxe service" as compared to the regular service, and for which a much higher fare would be charged than that imposed by regular buses and rail service.

From time to time during the past several years our views have been made known at conventions of the A.E.R.A. and through articles in electric railway publications, and these views have not been materially changed through experience; and these include the view that the place of the bus on the electric railway properties is of the auxiliary or supplementary nature. It has been, and is, the practice of the Pacific Electric to establish and maintain bus lines simply as feeders to the main rail traffic arteries for the bringing of these people to the "metropolitan area," or in urban territory where traffic is light, in contrast to the plan submitted by Mr. Graham which indicates bus lines also entering the metropolitan area direct.

Bringing these buses into the metropolitan district would add very materially to the already highly congested street traffic and further impede traffic movement of the rail lines. The traffic congestion at this time is one of the most serious problems faced by this railway, both in local and interurban operations.

In several instances this company has acquired from other owners by purchase competing bus routes, but the service, with the approval of the public, has been made feeder to that of the electric cars. Feeder lines to our main rail lines are established in Pacific Electric territory when the need for such service is made manifest by surveys and where there is the probability that the line will pay its way; if not immediately, then within a reasonable time. It is our policy to abandon such service if, after reasonable trial, it does not develop sufficient revenue, either directly or as a feeder, to justify it.

It is agreed that the bus is a factor in transportation and as such must be viewed with an open mind, but its adaptation to territory either alone or in conjunction with rail lines is a matter for each individual property to judge for itself, because on no two properties will identical conditions be found and in no two sections will the same travel habit be found.

An important factor is the franchised auto carrier, which in some instances has acquired paralleling operative rights prior to commission control in semi-urban and interurban territory, operating at a lower fare than the rail lines, makes no commutation fares for workers, not attempting to carry peak loads—merely content to skim off the cream. This may or may not apply in communities elsewhere as it does in Pacific Electric territory.

It is evident, also, that a comparison of Pacific Electric urban conditions with that of Pennsylvania-Ohio properties could not be reasonably made because of the largely varying units of service operated in Pacific Electric territory, particularly in Los Angeles and its suburbs, where it varies from one to five car units, thereby taking it out of the single bus and single car comparative field. This diversity of units is necessary because of high morning and evening peaks of travel and variation of travel throughout the day.

So far as it relates to the Pacific Electric Railway, and we believe also to other properties of comparable size and traffic, with urban and interurban operations, mass transportation by buses is beyond possibility.

For our own purposes, the co-ordination of buses with rail lines as supplementary thereto and as feeders is the proper policy, with every effort bent toward expediting service over rail lines by the elimination of sources of delay, such as grade crossings, traffic congestion and unnecessary speed restrictions.

PAUL SHOUP.
President.

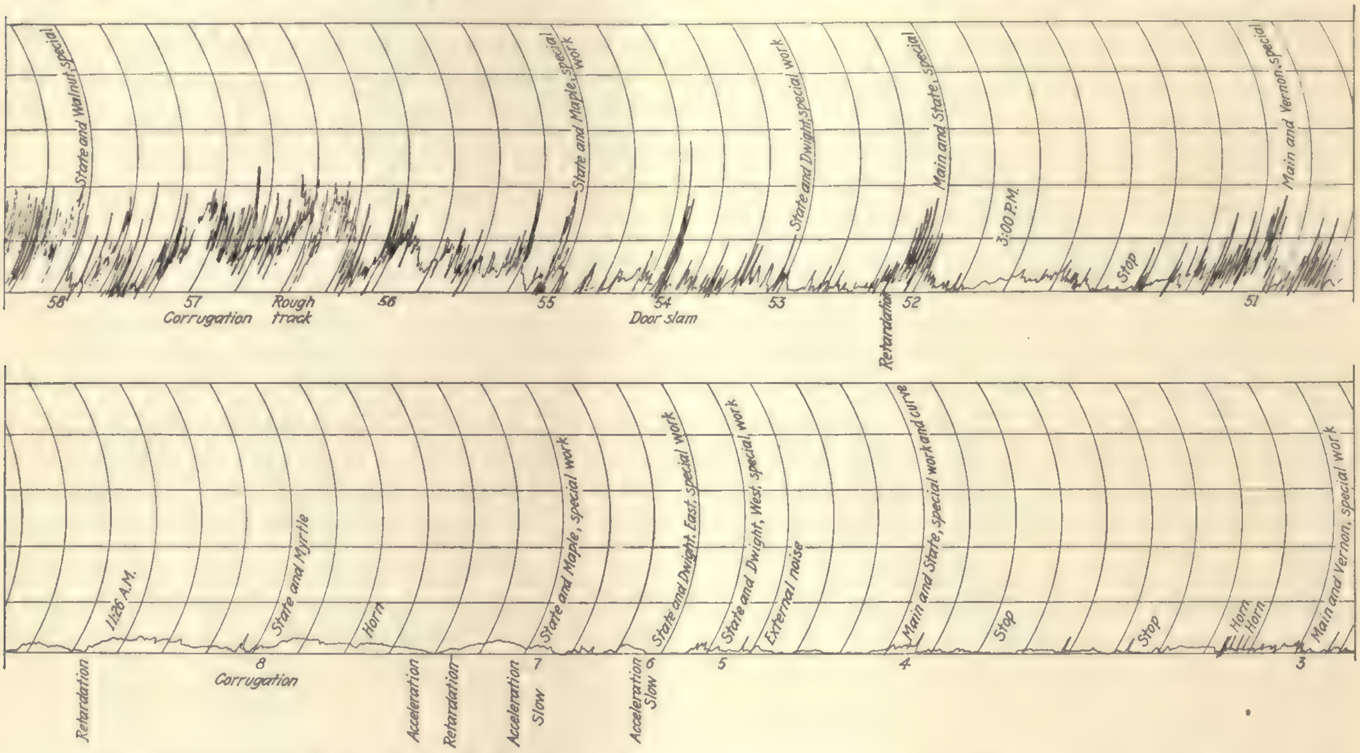
Test Shows Springfield Car to Be Quiet in Operation

SPRINGFIELD STREET RAILWAY
SPRINGFIELD, MASS., April 26, 1927.

To the Editor:

I have read with no little satisfaction your editorial of April 23 having to do with the noiseless street car. One part, however, I think is rather misleading. You say that "From the standpoint of noise reduction the car did not seem to live up entirely to what had been anticipated for this design. This was particularly true on the interior of the car." In this connection it should be understood that we did not expect to eliminate all noise, but were endeavoring merely to effect a reduction. That this has been accomplished in large measure is shown by the results of noise measurement tests made by Mr. Williams and his committee of the American Electric Railway Engineering Association. From the accompanying charts showing measurements made during a trip of one of our older cars and during a trip of the new car it will be seen that a substantial reduction has been made in the noise of operation.

C. V. WOOD,
President.



Noise measurements made on one of the older cars of the Springfield Street Railway, above, and on the new experimental car, below, show clearly that the latter is much more quiet in operation

Pacific Coast Company Leases Boats to Be Tied in with Railway

THE Key System Transit Company, Oakland, Cal., has been authorized by the Railroad Commission to lease to the Golden Gate Ferry Company, and the latter company has been authorized to hire and operate, the ferryboats *Fernwood* and *San Francisco* on the San Francisco-Sausalito line of the latter company, for a period of three years. The total rental will be $24,500 for each boat, to be paid at the rate of $700 a month per boat.

Maintenance Men

May 14

is the DEAD LINE for First Monthly Prize Material

Three Capital Prizes

First - -	$200
Second - -	$100
Third - - -	$50

Twelve Monthly Prizes

$25 Each

Don't Miss This Opportunity to Win

ITEMS published in the maintenance data sheet section of ELECTRIC RAILWAY JOURNAL dated May 21, 1927, will have the first chance to win one of the $25 monthly prizes. It takes some time to prepare material after it is received at the New York office. In order to prepare proper illustrations and set the type for the first items to be used it is necessary that material be in New York not later than Saturday, May 14. Contestants will still have time to get their material in after reading this, if they act promptly. Some items have already been received. This material has been edited and is ready for publication.

ELECTRIC RAILWAY JOURNAL is offering the prizes in this Maintenance Data Contest to help maintenance men win recognition which they deserve in the industry. Enter the contest at once. Send in as many of your maintenance practices as you like. The JOURNAL will pay $5 for each item published whether or not it wins a prize. The more items you send in the more chances you have of winning a capital or monthly prize. Get started at once. Maintenance men, here is your opportunity!

FOR the benefit of new readers and those who may have missed the announcements in previous issues of ELECTRIC RAILWAY JOURNAL, the conditions for competing for the various prizes offered in the Maintenance Competition are restated in condensed form. Full information will be found in the April 16, 1927, issue, pages 700-701.

Three capital prizes will be awarded for the three best maintenance ideas submitted before Aug. 1, 1927. These are: First prize, $200; second, $100, and third, $50. In addition twelve monthly prizes of $25 each will be awarded, one each month beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Sheet Section of ELECTRIC RAILWAY JOURNAL, and a minimum of $5 will be paid for each article published.

Any employee or official of an operating electric railway or electric railway bus subsidiary may compete for the prizes.

Each contestant may submit any number of items he desires. Each will be judged separately.

The prizes will be awarded primarily on the value of the idea presented and its adaptability to maintenance work on electric railways. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may describe any maintenance practice or device used by any department of an electric railway, such as the maintenance of rolling stock, buses, shop equipment, or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc.

Articles should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words, with not more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue and 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated before Aug. 1, 1927. Photographs or sketches that accompany the manuscript may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made. Photographs, sketches and manuscripts should be marked so that should they become separated they can be identified readily.

Monthly prizes will be judged by the committee, to be announced later, after the articles are published in the Maintenance Data Sheet Section, the best item being selected each month from those appearing in the issue in the month devoted to Maintenance and Construction.

The announcement of the winner each month will be made in the issue devoted to Maintenance and Construction, the third issue each month, following the one containing the items.

The winners of the capital prizes will be announced in the Annual Convention Number of the ELECTRIC RAILWAY JOURNAL to be published in September, 1927.

Maintenance Notes

High-Powered Snow Plow Mounting

EARLY this year the mechanical department of the Kansas City Public Service Company completed two high-powered snow plow attachments designed to fight the heaviest snow storms and clear the tracks of drifts.

The attachments were applied to cars of the Differential dump type equipped with four 90-hp. motors with HLF control. The plow is constructed of a special reinforced steel, 16 ft. long and 3 ft. high, hinged to the main steel underframing of the car and set at an angle of 45 deg. with the track. A smaller wing plow is hinged to the left end of the main shear and is used for cleaning up the devil strip between the tracks. The wing can be raised to clear obstructions, such as poles and standards, where the overhead is carried on poles between tracks.

The plow is raised and lowered from the cab by compressed air, controlled by a standard type of brake valve. It can be raised to a height of 10 in. above the rail by a movement of the air valve, thus quickly clearing any unforeseen obstacles on the track, and it can be adjusted to any desired height for plowing snow.

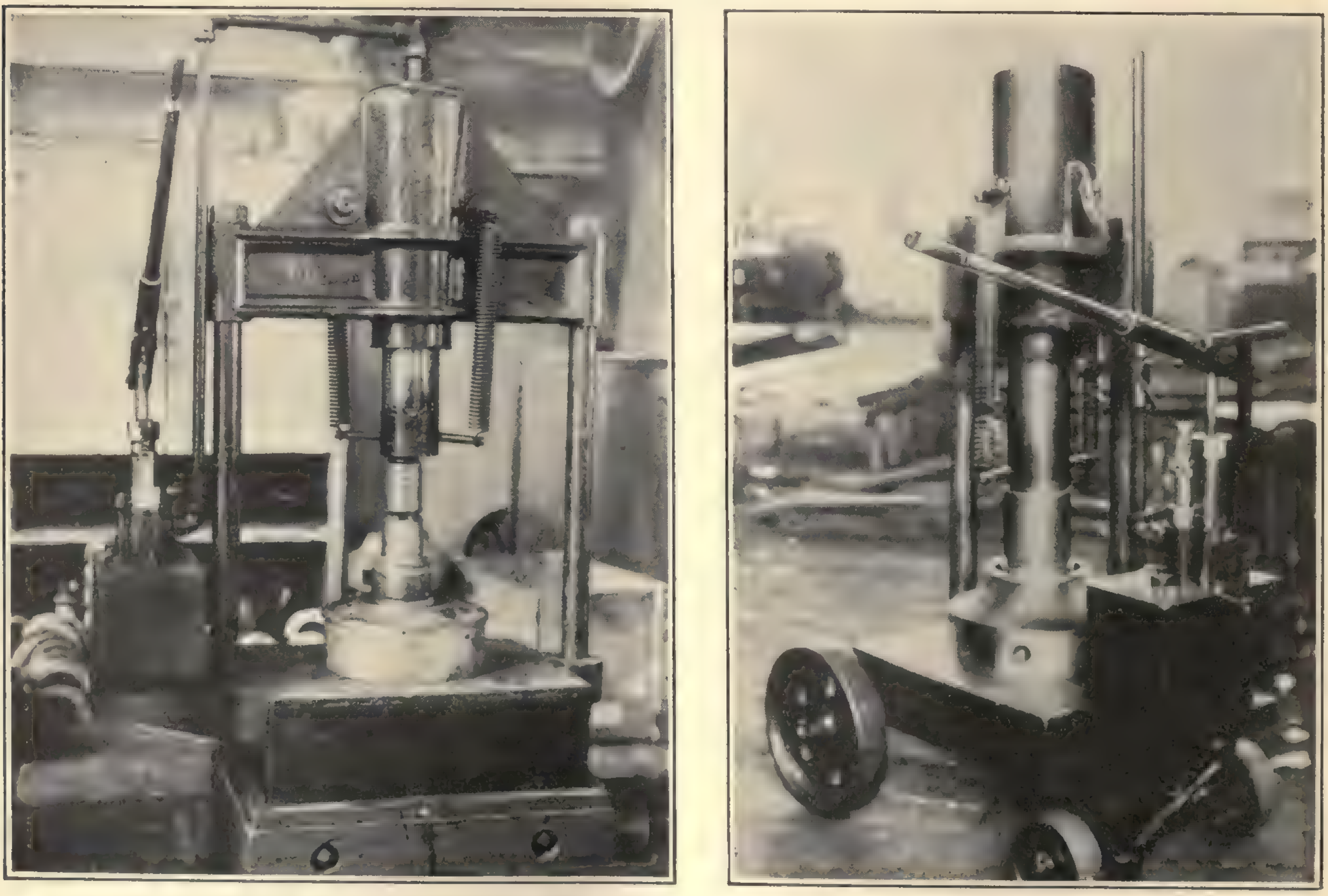
Provision is made so that the plow can be attached or removed on short notice so that cars can be used for regular construction work when not combating a heavy snowfall.

Hydraulic Presses Serve Many Purposes

HYDRAULIC presses are used for all fitting work around the shops of the Los Angeles Railway which does not require a pressure in excess of 15 tons. Seven of these presses are used on the property, five at the division inspection shops and two at the main overhaul shop. One of these latter is portable. All were made in the shops.

Construction of the press is relatively simple. The base is of cast iron, about 24 in. square and 6 in. deep, with tension rods and head support securely fastened in bosses on each side of the base plate. The head is carried approximately 20 in. above the base. The iron head casting contains the cylinder, which is lined with bronze. The ram, whose diameter is 4¼ in., has a stroke of 12 in. Return springs connected with cross arms near the end of the ram are secured to the head casting by drilled bolts.

The press is operated by a hand



Type of hydraulic presses used in the Los Angeles Railway shops

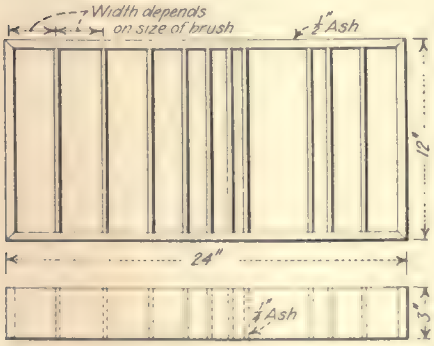
One of the stationary types is located at each division inspection shop. The view at the right shows one of the portable types which are in service at the main repair shop pump on top of an oil reservoir mounted on an extension of the base. The pump is of the single action type, the 24-in. handle having a leverage of approximately 6 to 1. Release of pressure is possible by depressing the handle to a point where it engages an extension of the relief valve. In the illustration the relief valve is shown directly in front of the pump cylinder.

Both the presses illustrated are being used to insert an armature bearing into its housing. On this particular work the pressing fit is between 0.004 and 0.006 in. A pressure of 3½ tons is required. A gage mounted on the top of the tee connection between the pump and the ram cylinder indicates this pressure. The illustrations do not show this gage.

Clean and fumigate your cars thoroughly on the inside so your patrons can't say "thanks for the buggy ride."

Receptacle for Storing Compressor Brushes

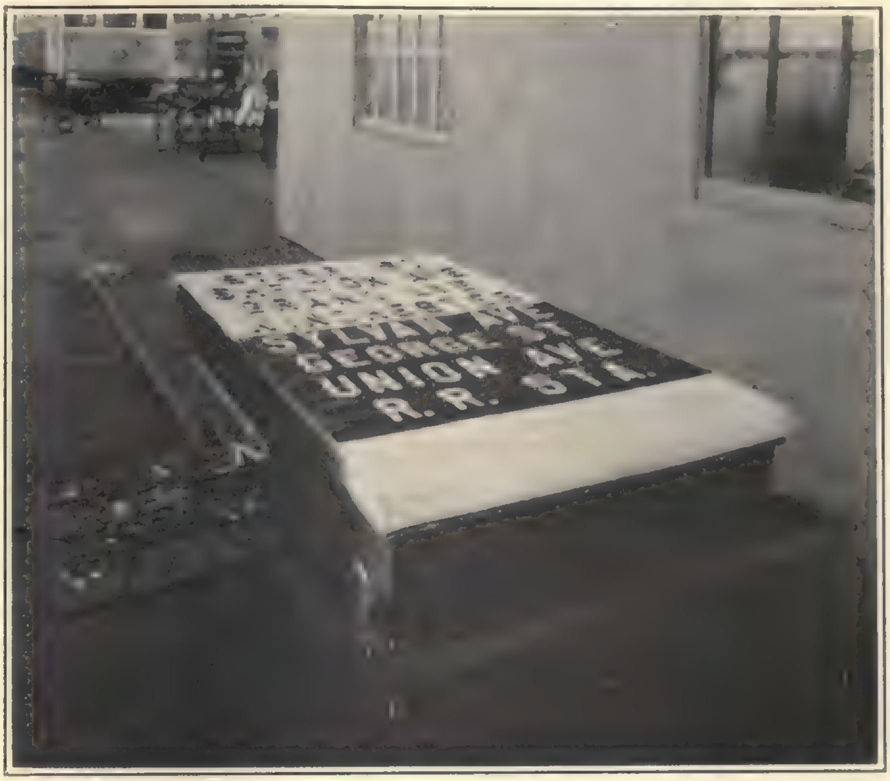
CHEAP but effective is a receptacle for the storing of air compressor carbon brushes designed and adopted by C. W. Wood, master mechanic of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va. It consists of a box made from ½-in. ash, 24 in. long, 12 in. wide and 3 in. deep. This box is divided into sections of such a size as will accommodate a certain size of brush and each section is stenciled for the type and style of brushes it can hold. A special section is included in the receptacle for the storage of worn-out or defective brushes.



Wooden box used by the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., for storing air compressor brushes

Prior to the adoption of this box brushes were strewn about the shop floor and the cost of brush replacement was exorbitant. This practice has now ceased, resulting in lower brush replacement cost.

Roll Signs Painted by Spray Method



Painting roll signs by the spray method in the Grand Avenue shops of the Connecticut Company

In this view the lower half of the sign has been painted and the metal letters have been removed to the near-by tray. On the upper half, which has not been sprayed, the letters remain in place.

MUCH time has been saved in the preparation of curtain destination signs by the use of spray painting at the Grand Avenue shops of the Connecticut Company, New Haven. Formerly new signs or sections of signs were made by outlining the letters and filling in the background by hand. A little more than a year ago J. E. Dooley, master mechanic, conceived the idea of painting metal dash signs by the spray method. Details of this process were given in the ELECTRIC RAILWAY JOURNAL for Aug. 8, 1925, page 211. It proved so satisfactory that recently it was adopted for roll signs.

A piece of sign cloth of the desired width and necessary length is laid on the top of a low table and secured by thumb tacks. One edge is then marked off in 6-in. lengths. A T-square is next lined up with the second mark from the top end of the cloth. Against the upper edge of the T-square are placed metallic letters 4 in. high. These are made of old babbitt metal by casting in forms made in the shop. The thickness of the letters is ⅜ in.

Watch your "P's" and "Q's"—pints and quarts of oil. And don't let your oiler be a lubricating bootlegger.

Spacing is done by eye. As soon as one line has been completed the T-square is moved down to the next 6-in. mark. After all letters have been placed, heavy pieces of paper are laid across the ends of the cloth to protect it from the paint. Black paint is then sprayed over the entire surface. The weight of the metal letters is great enough to prevent their accidental displacement during the spraying. After the painting has been completed the letters are lifted by means of wire handles and laid on a tray alongside the table.

This method produces neat, clearly legible signs, quickly and at moderate cost. Since its adoption the company has been able to re-equip all cars when they are overhauled.

New Equipment Available

Magnets Clear Roads of Nails

OPERATORS of buses can profit by the experience gained from clearing roads of nails, tacks and other metal pieces to reduce tire troubles and damage. Lifting magnets of types manufactured by the Electric Controller & Manufacturing Company, Cleveland, Ohio, are used to accumulate the various metal pieces. This equipment can be attached to a truck or bus and should prove a valuable maintenance unit.

The accompanying illustration shows the equipment as used in Kellogg, Idaho. A No. 3 type SA lifting magnet was suspended from the rear of a 5-ton truck so that its lower face was about 4 in. above the road surface. Electric current was furnished to this magnet by 72 cells of regular locomotive type Edison storage battery. This outfit was operated back and forth along the road until it had covered the entire surface. Operating over 5 miles of roadway, this magnet picked up 150 lb. of nails, bolts, wire and scrap iron, all of which constituted a severe menace to tires.

Lifting magnet applied to the rear of a 5-ton truck for picking up iron material from the roadway

At other places a different arrangement of magnets was tried. In Carson City, Nev., two lifting magnets, each of 22 in. diameter, were suspended between the front and rear wheels of a 5-ton truck with their faces raised 5 in. above the surface of the roadway. Magnetizing current was supplied to the magnets by a 5-kw. d.c. generator driven by a gasoline engine, mounted as a unit on the truck. In one round trip on a 100-mile section 1,370 lb. of nails, spikes and scrap iron were picked up. This equipment was also used to clean the streets in Carson City, where 4,850 lb. of iron material was picked up in two days.

Socket Wrenches in a Case

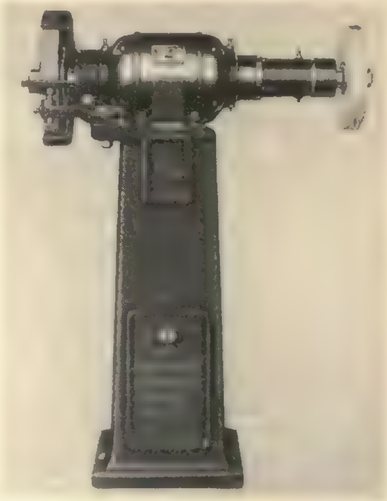
CHROME vanadium socket wrenches and handles packed in sets in an enameled metal carrying case with leather handle are being placed on the market by the Bonney Forge & Tool Works, Allentown, Pa. The set consists of ten chrome vanadium hexagon sockets from $\frac{7}{16}$ in. to $\frac{7}{8}$ in. inclusive and chrome vanadium handles. The handles included are solid offset, offset ratchet, sliding tee, solid tee 6 in. long, solid tee 12 in. long, two brace or speeder types 5 in. extension, 10 in. extension and universal joint.

One of the sets of ten chrome vanadium socket wrenches and handles

Combination Grinding and Buffing Machines

EIGHT new models of combination grinding and buffing machines made in 1 hp. and 2 hp. sizes are being marketed by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The accompanying illustration shows one of the machines which is equipped with incased type spindle extension and which because of its rigid double ball bearing construction is recommended for heavy-duty buffing, polishing and scratch brush work.

Some of the important details incorporated in the new line of machines include high grade over-sized ball bearings mounted in the heads in close proximity to the wheels. All bearings are inclosed completely and are protected from dust and grit. The oil chambers, with a capacity to last two or three months, have suitable flush or drain pot plugs to permit occasional cleaning. Grinding wheels have a diameter in proportion to the motor speed. This gives safe and efficient travel.

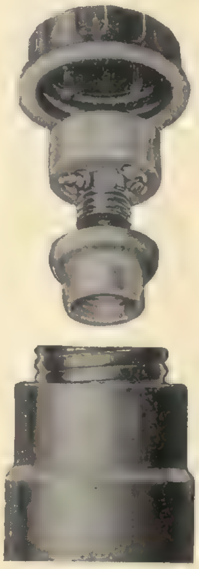


Pedestal type of combination grinding and buffing machine

Socket Installation Simplified

SOCKET bases fastened to the canopy by screws fitting into bayonet holes form a development in Durex sockets announced by the Wheeler Reflector Company, Boston, Mass.

This new principle in socket construction enables a twist of the wrist to remove or replace the socket in a moment. The porcelain socket shell screws on and off easily, exposing the contact screws for wiring.



New type socket

Association News & Discussions

Railway Section Shows Enthusiasm at New Orleans

ENTHUSIASTIC, active discussion of outstanding topics of the moment crowded the meetings of the railway section, Southwestern Public Service Association, at New Orleans on April 26-29. A preliminary telegraphic report of the convention was published in last week's issue of this paper.

The general subjects taken up by the railway men ranged from "Telling the Transportation Story" to "Modernization of Equipment." Traffic control occupied a large part of a full afternoon session. Discussion from the floor was active on each topic and Past-Chairman W. W. Holden, who presided in the absence of Chairman W. H. Burke, Southwestern district manager Stone & Webster, was several times forced to limit the discussion to keep within the allotted time.

Those who spoke or prepared papers for the meeting included President W. H. Sawyer and Managing Director Lucius S. Storrs of the American Electric Railway Association, A. J. Sarre, R. M. O'Brien, A. J. Naquin, Ben Commons, and Captain Casey of the Police Department, New Orleans; G. I. Plummer, B. R. Brown, C. J. Crampton, Dallas; R. C. Foreman, P. S. Duenweg, Carl Frazer and Public Service Commissioner C. J. Kirk, Houston; W. W. Holden, L. McInery, San Antonio; J. G. Holtzclaw, C. A. Brann, Beaumont; F. B. Scurlock, El Paso; C. L. Van Auken, Chicago; Charles Gordon, New York.

As reported last week, both President Sawyer and Mr. Storrs pointed to the changed conditions which face electric railway men to day. Their addresses before the general sessions of the association are abstracted elsewhere in this issue. Mr. Storrs commented on the active discussions which took place throughout the meeting and characterized it as an inspiration to railway men not only in the Southwest but in the entire industry as well.

Making Salesmen of Car Operators

Taking the topic of telling the railway story to the employee, Mr. Foreman outlined the work of coaching car operators to be salesmen. He held that the chief aim in coaching a group of employees is to train them so they will be responsible representatives of the company with initiative and judgment of their own. For this purpose he considered the academic and lecture method of instruction and training to be very weak. To win the active interest and co-operation of a group of employees, some point of common interest and ambition must be the foundation on which to build. Working on this idea in Houston, he found that the underlying ambition in every man's mind, to become able to speak on his feet and express his ideas, furnishes a basis by which employees are naturally attracted and by means of which their interest can be enlisted in self-improvement and in loyalty to the company's objectives in serving the public. A course of self-education has been successfully developed by the Houston Electric Company through the means of a class in public speaking. This class is composed of heads of departments and goes through the entire organization, taking the men in groups of fifteen to twenty. Through this course information is transmitted to each employee from the department heads and from the more articulate and intelligent of the employee group. More important than the information transmitted, Mr. Foreman pointed out, is the self-confidence which is built up and the interest in the work and in the company's problems that is enlisted. The ultimate objective is the development of each man as a salesman in the true sense of the term.

Practices of the New Orleans property in the training of employees were outlined in a paper by A. J. Sarre, which is abstracted elsewhere in this issue.

"Management is reflected as by a mirror in the action of the men on the cars," said acting Chairman Holden, speaking on this subject. He maintained that the management must be sincere in its thinking and actions and that unless that condition exists on a given property, the weakness will be reflected in the employees clear down the line. Even in the brief contacts which the railway manager has with his men, he explained, permanent impressions are made which affect the attitude toward the company and the public of every subordinate. "Men learn new things best by doing them." said Mr. Holden. In preparing a course of training, therefore, it was his opinion that this should be the guiding principle to be followed. He held that a proper training course should also give the man a real opportunity for doing his own thinking under proper direction. "If a man's heart is right and he is thinking, he may be expected to perform satisfactorily."

Practice in Advertising

Advertising as a means of telling the railway story to the public was the subject of a paper prepared by C. J. Crampton, and read in his absence by Mrs. C. C. Owen. Mr. Crampton found that railway practice favored daily newspapers as the best medium for addressing the public through advertising. Next to this he classed car cards and after that, billboards and moving picture films. He advised avoidance of specialized advertising such as one-time publications and programs. Money spent in these latter mediums should be classed as good-will contributions rather than as advertising.

Railway advertising in general he grouped in three classes as to the purpose: good will, merchandising the service and selling securities. The copy used for the first class is usually conceived from the viewpoint of keeping the public informed regarding the company and its activities. Sometimes copy in this class is devoted to talking about the employees of the company. This practice, according to Mr. Crampton, helps to inspire a desire on the part of the employees to live up to the standards set by the advertising.

In selling the service of a railway property through advertising, a number of copy appeals in use were listed. These include appeals built on the economy of electric railway transportation, dependability, safety, comfort, freedom from the petty annoyances of the automobile and opportunity for relaxation, reading, etc. The sale of service through advertising is only in its initial stages, is Mr. Crampton's opinion. He questioned the value of the "economy" appeal in copy, and felt that the public is more interested in "keeping up with the Jones's" than in "saving the difference." He expressed the opinion that comfort, dependability and freedom from traffic worries are more valuable selling appeals than that of economy.

Performance Must Live Up to Promise

The speaker cautioned against any attempt to exaggerate in advertising or to use advertising when the service does not measure up to the promise. Such a situation, he held, produces a reaction that is considerably worse than if no advertising at all were used. Mr. Crampton called attention to the increasing tendency to spend more money for art work and expert composition in the preparation of railway advertising. "Persistence," he said, "is the secret of advertising results with any particular kind of copy." Success in winning public approval, however, is dependent on providing a service which measures up to modern requirements.

The outline of a talk that is given to each new employee hired by his company was given by Mr. Brann. An abstract of his remarks is printed elsewhere in this issue. Mr. Duenweg testified to the value of the public speaking work in Houston as a means of interesting the men in their work and in improving their contact with the public. He held that when the men are really interested in their work and in pleasing the public, the company does not have to give much attention to telling its story to the public; that the men will do that most effectively. Commenting on this Mr. Holden said that not enough railway managers have sufficient faith themselves in the future of the electric railway business.

ENLISTING MECHANICAL MEN IN PUBLICITY WORK

Mr. Brown felt that not enough attention is given to the men in the various mechanical and maintenance departments. These men, he held, have frequent contacts with the public and become a powerful force for good or bad impressions. Mr. O'Brien called attention to the work done by the Association of Equipment Men, Southern Properties, and urged railway managers throughout the Southern territory to encourage their master mechanics to take part in the work of the mechanical men's organization. Mr. McInery felt that instruction in public speaking should be carried to the men in mechanical departments as well as to those in transportation work.

Speaking on the problems of improving traffic conditions, C. J. Kirk, Public Service Commissioner of Houston, criticised street railways for lack of frankness with the public on the matter of traffic control. This situation, he held, has developed beyond the crossing policeman and requires more scientific methods and study by experts. Street railway companies should take the initiative in bringing all the elements in a community into a united organization for the solution of an important and baffling community problem, as the representative of a large part of the people who make daily use of the streets. He felt that the average company is entirely too timid in demanding that consideration to which it is entitled in connection with this vital subject. American communities, he said, need help from the utilities in working out relief measures.

An interesting view of the traffic situation as seen by the man on the platform of a street car was given by Ben Cummings, a motorman of New Orleans Public Service, Inc. The first step in the relief of congestion, he held, is prohibition of obstacles to the free flow of traffic. Success of any ordinance or regulation which is put into effect for the relief of congestion is impossible, however, without co-operation of police, public officials and the railway.

A paper prepared by J. G. Holtzclaw on the subject of modernizing electric railway cars created considerable and lively discussion. An abstract of the paper is printed on another page. Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, discussed the significance of the developments in cars that are being made in various cities and showed a number of photographs of the new worm-drive car which was recently completed in Springfield, Mass.

In acknowledging his election as chairman of the railway section for the ensuing year, Mr. Paterson pledged himself to continue the good work which has been done by his predecessors, and among other things pointed to the importance for electric railway success of obtaining an adequate rate of fare which will permit a program of improvement to be carried out.

Public Is Getting Better Understanding of Local Transportation*

BY LUCIUS S. STORRS
Managing Director American Electric Railway Association

IT HAS taken years for the urban transportation industry to obtain a general recognition by the public of the basis upon which operations can be successfully developed and maintained. Then, too, there are yet all too many places where these fundamental facts are still beclouded, either by a lack of full information or prejudices which frequently are the inheritances of old conditions that the public holds against the present operators, despite the injustice of it.

Briefly these fundamentals are: (1) The dependence of any community upon public transportation for its growth and the personal prosperity of its people. (2) An appreciation on the part of transportation executives that while an irreducible minimum of passengers will use the services because they must; to become entirely solvent the company must offer such service as will invite a vastly greater use of the cars or buses. (3) A complete willingness on the part of the people to make their transportation corporation a profitable business enterprise either through a large use of the cars or a somewhat lesser use at higher rates. There is nothing mysterious in our business and through no legerdemain can profits be established; it is just a plain business proposition. The public needs efficient service, nor does it care one iota who provides it.

REMARKABLE RECORD LAST YEAR

Local transportation service, with street cars as the backbone and buses being used supplementally, is making rapid strides in most parts of the United States. During the last year electric railway managements furnishing this joint service and embracing 78 per cent of the total carried some 14,600,000,000 passengers. Doubtless the entire industry carried many more than the previous high record of 16,000,000,000. Even this old record is about seventeen times as many riders as were carried by the steam railroads and many times the number carried by independent bus lines not run by street railway companies. It is three out of every four persons who ride in the streets in any kind of a vehicle. In other words, for every person who rides in a taxicab or an automobile or an independent bus in American cities three persons ride rail lines and buses run by electric railway companies.

This is a remarkable record, particuarly when we recall that less than ten years ago, due to increased costs caused by the war, one-sixth of all the electric railway mileage in the United States was in bankruptcy or receivership. It was then generally predicted that electric railways were dead. Now they are growing stronger daily, primarily in metropolitan centers.

Improvement of local transportation in any given city invariably follows these steps: (1) The adoption of an operating agreement, contemplating high-class service, with modern equipment for the riding public and a fair return on the value of the property to the investor. (2) Elimination of competition by the placing of all local transportation, including rail and bus service, into the hands of single managements under the direct supervision of public authorities. (3) Elimination of downtown parking of automobiles. The fare issue, which once was the chief cause of controversy in almost every city, no longer is the dominating one in most communities. Public officials who put good service first generally have long since recognized the need for higher fares to meet increased costs and willingly grant them. As a result, the average fare for the United States today is 7¾ cents, and 10 cents in most large cities. Fares which permit just returns for owners of the properties are quickly reflected in improved service.

Service also is being improved in many communities through readjusting electric railway taxes, thus giving the companies more money to spend on general betterments. The most general tax adjustment being made at present concerns paving. In five states and some 50 communities companies have been relieved of paving costs in whole or in part. This is only simple justice. During this legislative session New Jersey has fallen into the line of progress, a bill for the relief from this tax having been enacted.

That competition destroys service and that the best results are obtained from permitting single companies to operate both street cars and buses in their respective communities is being proved repeatedly. The thought of a few years ago that the competing buses would drive street cars off the streets, or at least compel them to reduce fares, has been clearly shown to be unsound. Competition has damaged service and increased fares. Throughout the country there is a general movement toward the consolidation of street railway and bus lines under single managements. Three hundred and thirty-two electric railway lines now are operating nearly 8,000 buses and good results are being obtained from this co-ordinated program.

RAILWAY EXTENSIONS CONTINUE

Instead of replacing the electric car, the bus has added greatly to unified public transportation service. During the last ten years more electric railway track has been built than has been abandoned and the bus has driven very few lines out of business. They have added some 15,000 miles of extensions to electric railway properties, tapping new territory where the traffic was not dense enough to warrant the laying of rail lines.

The bus is finding its place in serving as a supplemental carrier to the electric and steam car. It has not replaced the street car widely because it cannot carry large numbers of persons as cheaply or quickly in congested centers. Where passengers are few and scattered the bus can give a service, even though unprofitable, that otherwise would not be possible. It is finding a much wider use in providing an auxiliary type of service to the rail lines which can only be given by a different kind of vehicle—one that more nearly approximates the private auto.

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*Abstract of an address before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

There are almost 3,000 more electric cars in regular daily use today than there were in 1919. For instance, Los Angeles alone has 671 more cars in regular service than it had in 1919, Detroit 446, Chicago 425, Pittsburgh 175, St. Louis 155 and Milwaukee 114. The discontinuances of rail lines have been scattered through about 60 small towns. They occurred in such places as Albany, Ga.; Streator, Ill.; Iola, Kan.; Hattiesburg, Miss.; Nelsonville, Ohio; Lykens, Pa., and Waupaca, Wis. The average operation was seven street cars to a town. Generally speaking, street car service never should have been started in these small cities and would not have been if buses were available when the rails were originally laid. Many towns too small to support an electric rail line find the bus useful.

There is no indication that electric lines in urban centers are going to be seriously affected by the bus. There is every indication that the electric railways will continue to use the bus as a very helpful supplemental agency and through its use will find entirely new types of service that will attract the public. This growth is evident wherever local transportation company managements and the public, represented by city and state officials, have ceased bickering, quarreling and mud-slinging and sat down at round-table conferences to iron out their problems. The need for good transportation is mutual. Companies must give it or they cannot make fair earnings. Cities must have it or they cannot prosper. Recognition of this fact and an honest desire on the part of both public and management to play fair inevitably results in progress and profit for all.

PUBLIC OWNERSHIP UNDESIRABLE

There is more or less talk at present regarding the advantages of public ownership of public utilities. Sometimes there is talk of cities taking over electric railway properties, though not as often as of other utilities, it is conceded. A few cities have taken over the street railways and the results have not been particularly gratifying, to the public who furnished the money with which to purchase them, the riders who paid higher fares or the unfortunate managements who tried their best to render good service and carry out the orders of politicians at the same time.

A brief summary of the results of public ownership of electric railways gives such a convincing picture of inability to produce any remarkable achievement and the entire lack of claimed public betterment as a result from lower charges that the local transportation branch of the public utility business should be in little danger of having to undertake an active campaign against such attack. In fact, these spasmodic efforts of the public to provide service of this kind in a manner or at a cost that would receive public acclaim should be useful to the utilities as a whole in any discussion of the subject.

EXPERIENCE CITED

Detroit is a good example. Fares there have been raised under public ownership, but that is not the worst thing that has happened. Just as predicted, just as invariably happens in a case of public ownership of a public utility, local politicians soon got into the saddle. Detroit already has had three general managers of its municipal railways, and they alone know what a difficult job it has been for them to try to run the railway lines to suit the politicians. The fact is that the property is shot through with politics, that because of this the morale of the men on the lines is low, and that this condition is likely to continue just so long as the city, which means the politicians, operate the cars.

COMING MEETINGS
OF
Electric Railway and Allied Associations

***May 11-12*—Central Electric Railway Master Mechanics' Association, meeting, Webster Hall Hotel, Pittsburgh, Pa., 9 a.m.**

***May 12*—New England Street Railway Club, meeting, Copley Plaza Hotel, Boston, Mass., 3.30 p.m.**

***May 18-19*—Central Electric Traffic Association, meeting, Tuller Hotel, Detroit, Mich., 9 a.m.**

***May 31-June 1-2*—Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

***June 6-8*—American Association of Engineers, annual convention, Tulsa, Okla.**

***June 9-11*—Midwest Electric Railway Association, annual meeting, St. Louis, Mo.**

***June 19-23*—International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

***June 20-24*—American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

***June 20-24* — American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

***June 24-25*—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

***June 29-July 1* — Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

***June 30-July 1* — Tramways and Light Railways Association, annual meeting, Bath, England.**

***July 27-29*—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

***Oct. 3-7*—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open Oct. 1 at noon.**

San Francisco is having its troubles with a municipal line. Only part of San Francisco is served by the municipal property. It has been able to get along on a 5-cent fare by virtue of serving chiefly the territory of dense traffic and by a clever system of municipal bookkeeping which relieved the property of tax charges, depreciation costs, etc. Now extensions are needed, and within a month Adolph Uhl, manager of the San Francisco City Efficiency League, a prominent local body, has declared that proposed extensions and other costs would compel an 8-cent fare.

Seattle's experience is well known. The city took over the street car line because the politicians objected to an increase from a 5-cent fare. Under municipal operation a 10-cent fare soon was reached. Then, to prove that the way to make money was to have a 5-cent fare, it was restored. After the city had lost $750,000 experimenting with the nickel fare, the 10-cent cash or three tickets for a quarter fare was returned. Now the property is having trouble meeting its interest charges and the rolling stock is deteriorating.

These three outstanding examples of what municipal ownership of traction properties mean in the United States should be enough to warn any municipality against it.

Traffic congestion due to parked automobiles is one of the most serious problems of local transportation in every city. The 75 per cent of the people who use electric cars and buses as a means of transportation are being viciously delayed by the small minority who are permitted to park their automobiles in downtown streets. The common-carrier riders are the chief sufferers, but the majority of motor car owners, who cannot find places to park, also are being delayed by the select few who use the streets for garages.

DOWNTOWN PARKING MUST GO

A widespread protest against downtown parking is under way in this country and its result is as certain as tomorrow's sunrise. Downtown parking of automobiles must go. Nothing so unfair to a majority of the people can remain. The streets were built by all the people to be used as highways, and not as storehouses. Therefore, every vehicle which uses them, whether it be a street car, a bus or a private automobile, is entitled to reasonably free movement.

This fact has been recognized in Chicago, Los Angeles, Pittsburgh, Philadelphia, Cleveland and some parts of New York. Wherever parking has been wholly abolished, or restricted, street car and bus service carrying a vast majority of the people has been greatly improved.

Parking should be abolished particularly during the morning and evening rush hours. Generally, these hours are from 7 to 9 and 5 to 7. Most electric railways carry half of their total day's load during these four hours. Of the 43,000,000 daily passengers in the United States more than 20,000,000 are handled during these four hours. These 20,000,000 especially, most of whom are workers anxious to get to their places of employment or home to their evening meal after a hard day's work, are entitled to a clear path. There is no excuse for empty cars being parked along curbs so that moving traffic has to get over on the car tracks and obstruct workers. Think of the injustice of a parking regulation which permits one man to park his car at a curb and throw moving traffic over in front of a street car and thus delay 75 or 100 workers.

Good local transportation service makes prosperous cities and adds to the comfort of the people. It can be obtained by passengers insisting that they and the operating companies get a square deal. The people of this country want honest business to have a fair chance, and when shown that the utilities are being honestly conducted, the vaporings of the proponents of public ownership will fade rapidly.

However, it is important to bear in mind that the public must have the whole truth and nothing but the truth. It must be told to the public openly and aboveboard. No other method will insure justice to the utilities, nor should it.

Community Welfare Demands Transportation Improvement*

By W. H. Sawyer

President American Electric Railway Association

THERE was a time when one of the foremost ambitions of the electric railway executive was to induce people to ride the street cars instead of wasting the extra time by walking. Then there was a period when we first commenced to feel the effects of the privately owned automobile, it being first used by the more wealthy. Today one out of every five people has an automobile; a large number of people use their machines to go even a few blocks. Its use is confined not to pleasure riding; it is a necessity. There was a time when many questioned whether the number of automobiles could continue to increase. Today nobody questions but what there will be a continuing increase.

This means that every highway and every street that is to be of any real public use must be paved. It means that the traffic and parking problems are most complicated and pertinent civic problems. It means that there is not today the necessity for public transportation as previously existed, for as large a percentage of our population. It means that the street car riding habit is not maintaining its former rate of increase with the increase in population. This leads many to the erroneous conclusion that the day of the street car is past; that there is no longer the need for public transportation. The thinking man, however, cannot escape the fact that there is still an appreciable number of people who must depend upon public transportation all of the time, and it is also a fact that all of the people need public transportation some of the time. We are therefore confronted with the fact that public transportation still remains a necessity, and unquestionably will continue to remain a necessity. It is also apparent that with the changed conditions and with such acute competition many electric railway lines cannot survive if they are to continue to be operated with the same class of equipment and the same methods which were in vogue fifteen or more years ago. Many of these electric railway lines cannot survive if the communities served are to continue to treat their railways on the same basis as a generation ago.

I will talk later about what the electric railway companies are doing and should do to meet these changed conditions, but let me expand upon the situation which confronts you as citizens interested in the welfare and development of your community.

Noting the congestion of automobiles on the streets and on the highways, it is a natural thought that most people today are traveling by automobiles, but if you take an average important city street car corner you will find that the big bulk of the riders is in the street cars, not in the automobiles. This is due to the fact that practically all checks of automobile traffic show that on one important street there were more than five times as many pleasure vehicles as street cars but that the street cars carried more than twice as many people. Another check on an important thoroughfare showed fourteen pleasure vehicles to one street car, but even then the street cars carried 60 per cent of the total riders. Checks at large department stores and shopping centers show that more than 75 per cent come today by street car. These are typical illustrations, and yet there are those who say that the street car is obsolete and should be thrown into the discard. The important point I want to stress is the fact that the street car carries the bulk of the people and is the efficient transportation vehicle, and this should be taken definitely into account in all traffic regulations, including parking restrictions.

Unreasonable Burdens Restrict Service

There was a time when the electric railway was considered to be fair prey. The fare was fixed at 5 cents and any tax or obligation imposed upon the railway company was assumed to be beneficial to the community. There was a time when it was considered legitimate to force the railway companies to pave between the tracks and 1 ft. outside. Such a tax today imposed upon the car rider is not only unjust but is actually disadvantageous to the community. There must be a realization on the part of not only the public officials but the people generally of the fact that burdens put apparently upon their electric railway company are in reality burdens put upon the car riders, or are burdens which directly affect the ability of the company to furnish needed service.

I have no sympathy for the man who comes to my office and complains of the street car fare. I am all attention and am desirous of co-operating with the man who comes in seeking better service. Even in the case of the street car company which is today making a fair return on a fair value, the community would be the loser if the fare was to be decreased. What is needed from the community standpoint is more and better service. The average street car fare has not increased in proportion to the increase in cost of living, although admittedly the cost of labor, which is the most important item in street car expenses, has more than doubled and we are today operating more seat-miles per passenger than ever before.

Cash Fare Should Be Ten Cents

Also keep in mind that the automobile users are paying several times the cost of the street car ride for the privilege of riding in automobiles. It seems absurd that there should be even a quibble as to 1 or 2 cents difference in the cost of a street car ride when this charge is compared with the cost of operating an automobile, and when the charge is necessary for community progress. I doubt if there is a city in this country that from a community standpoint should not have a 10-cent cash street car fare, although where practicable there could be a lower ticket fare.

Our politicians have in the past too often felt that it would enhance their political fortunes if they could be the instrument through which the street car fare was lowered, or failing in that, if they could prevent any increased fare. There always will be politicians of this class, just as there always will be a certain class of people who are not broadminded enough to want to study a stiuation constructively, but there is undoubtedly a definite tendency toward a realization that transportation problems are technical and business problems to be solved on their merits for the benefit of the community. It is also becoming more generally recognized that the street car company, being a community asset and necessity, must be allowed to charge a fare commensurate with the cost of the service or eventually it will cease to function and the community will be the loser thereby.

There is unquestionably less political agitation against street car companies today than at any time within the last twenty years. We need only to have a thorough understanding of our community problem to arrive at a solution satisfactory to all concerned. There is no class of citizens which has a plainer duty along these lines than you operators of other public utilities. There is also a particular duty which devolves primarily upon you, and that is, to explain some of the fundamental differences between our operation and your operation.

No industry has any higher ideals as to public service than the electric railway industry. No industry is trying more faithfully to carry out those high ideals. You electric light and power operators have for years had money available so that you have been able to do many things for the advancement of community prosperity which the electric railway companies have been unable to do. We electric railway men have a more complicated and more complex problem with our customers than you electric light and power men do. We meet our customers twice a day mostly under disadvantageous conditions which cannot be avoided. It is impracticable to give every passenger a seat during the rush hour. The cost would be prohibitive. We not only meet our customers twice a day, but every time we meet them we must ask them for money. Try as we will it is impracticable for us to give as general satisfaction to our customers, except as there is an understanding of our problems and the limitations inherent to our particular industry.

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*Abstract of an address before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

In many localities there are executives serving in a joint capacity in both industries. The intensity, complexity and the details of the railway problems demand that such executives give just as much time as practicable to the study and solving of these problems, while, comparatively, the electric light and power end is able to progress and go forward to the satisfaction of the community with appreciably less effort on its part. Let me say to you light and power people that our problem is your problem, but above all, it is a common community problem.

Permit me to say just a word about buses. There are few, if any, communities where the bus cannot be used to a greater or lesser extent to good advantage, but the electric car will remain as the foundation stone and backbone of our urban and interurban transportation. With both methods of transportation being used it devolves upon the electric railway operator to study and analyze his conditions so that each vehicle may be used in its proper place to the best advantage. The bus must not be used in direct competition with the electric car, where both are seeking the same class of business in the same territory.

Co-ordination Is Real Problem

Many of us electric railway operators hesitated too long before we fairly attempted to utilize the bus advantageously. Many of us have made mistakes in attempting to utilize the bus. It is a real problem as to where the bus best fits in and where the electric car best fits in, and it is a real problem as to how the bus can best be co-ordinated with the electric car. Too many of us have operated buses unco-ordinated and that is an economic waste. It is also an economic waste to scrap existing transportation equipment and investment, except as it becomes absolutely necessary to do so. Such confiscation will ultimately react unfavorably on any future transportation investment.

There are still some electric railway men who are not meeting the changed conditions of today in the operation of their electric cars, but a great big bulk of electric railway operators are meeting these new conditions with changed equipment and changed methods, which entitles them to be at least in the category of having done their share toward meeting the changed community condition. It is interesting to note that those companies that have been the foremost leaders in progressive management and utilization of modernized methods and equipment are those companies that are making the best showing on the balance sheet.

No one is excusable for not having adopted progressive methods, but some of us are excusable for not having modernized all our equipment. We know that there are some electric railway lines which will eventually go out of business due to the changed conditions, but we are only part way through this reconstruction period. The dividing line is not yet in all instances clear. We know that those companies and those lines that are to survive must be modernized, and we also know that this will cost an appreciable amount of additional new money.

The number of companies in receivership has been very much decreased; the amount of scrapping has been really inappreciable and the number of companies that have modernized is constantly increasing. By modernizing I mean primarily that we are putting on equipment which has a very much greater appeal to our customers, equipment which is in keeping with the thought and trend of the day, equipment which is probably lighter and faster, and certainly is more attractive, more comfortable and more luxurious, and also more costly. Let me also add that until we have brought our railway equipment and methods up to date we are in no position to pass final judgment on the status of the bus or as to its proper functions when used in a comprehensive co-ordinated transportation system.

Today is a different day. We are living in an age of which the fast, luxurious, costly automobile is symbolical. The changed conditions have materially affected the electric railway industry, but it is still a most vital and essential industry. It must and will go forward. There has been definite, appreciable progress in the solving of its problems. The operators of the industry are striving, thinking, analyzing and constructively working as never before. They are capable, honest and sincere, and giving of the best of their skill and ability to solve these problems which are so vital to our civic prosperity. The industry asks not for sympathy, but it does need and must have constructive co-operation in solving this community problem.

Training Electric Railway Employees for Their Jobs*

By A. J. Sarre
New Orleans Public Service, Inc.

Many factors contribute to the development and holding of the good will of the public served by a street railway, but the most important factor is a well trained employee.

If, however, we compare the amount of attention that has been given by management generally to the problem of increasing the efficiency of the rolling stock, the improvement of roadway, and power distribution and generating equipment with what has been given to increasing the efficiency of the man power, we will find that the human side has been woefully neglected. We spend time on the improvement of our machines and fail to realize how important it is to spend some time on the man who is going to be responsible for their successful operation. It is interesting to note how willingly any amount of time and study will be invested in the expenditure of a few dollars for a piece of equipment to be absolutely sure to have it just right, and how impatient we get when it is necessary to spend a few minutes explaining a problem to the man who has to handle that equipment.

The cost of training a man for a job has been variously estimated by engineers at from $35 to $600. It costs the New Orleans Public Service about $51.32 properly to train a new man to operate a street car. This is over and above the cost of hiring the man. The contrast between the extreme care given to the selection and installation of equipment and the general lack of consideration and total lack of system in handling the human element is certainly striking and marks us as being most inconsistent. If we consider the proposition entirely from the money side, wherein lies the difference between wasting money on inefficient or inadequate machinery or having it wasted by poorly trained inefficient workers?

Intelligent Interest by Men Needed

Let us consider it now from another angle, that of public relations. The public knows the street railway organization in terms of motormen and conductors, and it is through the words and actions of these men that the public praises or condemns the company. Every act of an employee is interpreted by the public as a reflection of company policy. It does not differentiate between the individual and his employer. The company and its service is judged entirely by the actions of the men who operate the cars. If these men are properly trained in the mechanics of operation and in addition are trained to interpret every phase of operation in terms of effect on the public we can be sure that they will render the right kind of service. There is nothing that will contribute more to building up good will than the service rendered by a properly trained employee who by virtue of his knowledge of the job takes an intelligent interest in doing the job right.

The point that should now be considered is how to organize and carry out a satisfactory training program that will adequately meet the needs of the organization and the basic principles on which such a program must be built. The first basic principle is that the management must be entirely sold on the need and desirability of systematic training for its employees. It means that the management must be willing to pay for such training. The axiom that it takes money to make money holds just as surely in this proposition as it does in any other field of management. The recognition of the need and importance of the right kind of training as well as its value must go from the top down. The stimulus cannot and will not come from the bottom up. The management must be honestly interested in the proficiency of its employees. By an honest interest is meant one that is free of sentimentality. There is nothing as useless as an educational program based on the paternalistic theory that it is being done only to help the workers, that it is entirely philanthropic, that the management does not expect to profit through their improvement. If the results to be obtained are not mutually beneficial, then the program is not sound and is doomed to disaster.

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*Abstract of paper delivered before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

EDUCATION TIED UP WITH OPERATION

The second principle is that the educational program must be definitely tied up with operation. It must not be set off as a side issue but must definitely function as an aid in increasing operating efficiency. Department heads, foremen, supervisors and other line executives must realize that they have a definite responsibility for aiding in providing the right kind of training both for new men entering their departments and for those who have been a long time on the job. The responsibility for having properly trained men on the job must always remain with department heads in charge of operation, but the machinery for providing this training will frequently be the responsibility of some separate department or division. There is one thing, however, that must be kept in mind and that is the fact that carrying out an efficient educational program for the employees of an organization is no inconsiderable task if it is done properly. It will require the same careful study and analysis of operation as is required of the engineer in designing equipment. When an educational program is started without an analysis of organization needs and the setting up of a plan to show what is desired and how it is to be accomplished, there is bound to be a loss of interest, time and money.

It also means an analysis of the individual job of motorman, conductor, supervisor, etc. It means finding out just what the elements are in each job. What are the various things a motorman must do to operate a street car successfully? He must stand in a certain position, otherwise he will work in an awkward manner. There is a certain speed at which a car must be fed, a certain way to apply the air. All of these things must be considered. They must not only be listed in a systematic way, but must be studied from two angles. First, successful operation of the equipment, and, second, from the standpoint of the passenger—each of the operations mentioned has a separate effect on the car as a piece of equipment and on the comfort and safety of the passengers.

The same thing is true of the supervisor or inspector. He must know whether or not an operator is rawhiding his car, because that damages the equipment. He must also understand the effect such operation has on the passenger. He must be able to deal successfully with the passenger whose frame of mind has been upset by some conductor blindly following rules and throwing reason to the winds. He must also know how to interpret company policy to the men on his lines and see that they carry on their work in accordance with that policy. He must know how to handle men to get the best work out of them, and that means a practical working knowledge of human nature. He must know how to maintain schedules—and keep the proper headway between the cars in order to provide adequate service.

If it is known just what operations and practices are to be followed on a certain job, it is an easy matter to check up on the way a new man is being trained by his supervisor or by an older employee. It is easy to determine whether or not he is being thoroughly instructed on all points, and nothing is being missed. It likewise serves as a check on the man who is doing the teaching. Does he really know his job or is he just getting by? Is there anything about it that he is unfamiliar with and where some special instruction might help him? Has he developed any bad operating habits since he was broken in? Is he working in full accord with the policy set up by the company? Putting a new man with one who has been a long time on the job is absolutely no assurance that the new man is being properly trained. The only way to be sure that he gets the training needed is by providing some definite system for supervising and checking the instruction as it is given.

DUPLICATE ACTUAL CONDITIONS

The actual instruction in operation and in dealing with the public should be given under conditions as near the real thing as it is possible to get them. It is much easier for the man to carry the instructions over to the job if he is trained under the same conditions and not on some artificial set-up that does not match with actual operating conditions. The training can be carried out by first having the men break in on special equipment set aside for this purpose under special instructors, or by actually going out on the road under the instruction of a regular line operator from the beginning. It is the practice generally when special equipment is set aside for new men to break in on to put them out afterward under experienced men designated as platform instructors. This is the general plan followed by the New Orleans Public Service, Inc., in training operators.

The training of supervisors must cover not only instruction in operation, but how to deal with the public and the simple principles of management. He must know how to handle men, how to get results at the least cost. It has been customary in the past to pick out some successful operator, promote him to a supervisory position and expect him to make good simply because he knows how to feed a car properly. It was expected that he would just naturally pick up whatever executive training he needed. In most cases he floundered around and after a long series of mistakes, sometimes very costly, managed to get by with some degree of success.

Here again it is necessary to provide a form of training, and one of the best methods that have been devised to date is the foreman conference. The general plan of the foreman conference consists in bringing the men together at regular intervals and having them discuss the different phases of their work under the direction of a competent leader. No books are used. The leader, through the discussion of a series of illustrations based on his experience and cases submitted from the experience of the members of the group, gets them to arrive at definite predetermined conclusions. When conclusions are arrived at in this way by a group of men, they rightfully believe that they are responsible for the decision and stand by it as being correct. A few of the subjects that have been discussed in this way at meetings of the transportation supervisors of the New Orleans Public Service, Inc., are "The Supervisor's Responsibility"; "Co-operation"; "Public Relations"; "Interest"; "Accident Prevention"; "Planning" and "Orders, Records and Reports."

PROPER ANALYSIS DESIRABLE

These meetings are held on company time and are considered just as much a part of the job as is keeping cars on schedule. The men appreciate the opportunity to discuss the important phases of their work with each other and the interchange of experience under the right kind of guidance is of considerable value. Here again the importance of analysis as a means of increasing efficiency is forcibly brought out. Each man is more or less forced to analyze his job in terms of the particular subject under discussion, because when he expresses his opinion on the subject he must be ready and able to defend it. The other members of the group are ready to check him up whenever he goes wrong. One of the most essential factors in the success of the foreman conference work is the confidence of the men in the management. If the management invites them to participate freely and to express their opinion, it must be ready to stand by and actually let the men talk. No man is going to talk freely if he feels that what he might say is going to be used against him in the future, that his suggestions are going to be taken as criticism and resented. If we ask our men to be honest and express their opinions freely in the interest of the organization, we must be honest and fair and not deal unjustly with the man whose opinions do not entirely coincide with ours.

There is still another type of work that is being carried on by a number of companies. This consists of special night courses designed to meet the needs of their employees from a general standpoint. There are at present fourteen different night classes in operation under the supervision and control of the New Orleans Public Service, Inc., for its employees. Eight of these are in practical electricity, four in accounting and two in shop arithmetic.

The instructors are all company men especially selected for their ability, training and experience. They are familiar with the property and can intelligently answer questions in their respective fields that are brought in by the men who are in daily contact with the work. It is very difficult for an outsider to get this information, consequently the company instructor can make the work much more valuable and interesting to those taking the course by the type of illustrations he can offer to explain the theories they are studying. The courses, being under company control, can be designed specially to meet the needs of its men. The average public night school has to take care of people from all types of industries and is forced to generalize in its instruction, leaving it up to the students to make the necessary application. Here again it is essential that such a program be looked upon as mutually beneficial. The employee gives his time and profits thereby, the company stands the expense and should also expect to profit by having a better trained group of men and women to carry on its work.

One of the unfortunate things about the problem of training employees is that we can accurately account for every dollar spent to pay for instructors, books, time away from the job, etc., but we cannot adequately measure the results obtained in dollars and cents. If the good accomplished could be measured in dollars and cents, the total amount would more than likely be staggering in its magnitude. It costs this nation a huge sum of money to provide the necessary facilities for teaching its people to read and write, but what would it cost us if our people did not have these facilities? Can the value of these facilities be determined in dollars and cents? Can the value of a well-trained employee, one who knows his job, is interested in it and knows the real meaning of co-operation, be measured in terms of dollars and cents? It would be extremely difficult to make such an appraisal.

How Far Should We Go in "Dressing Up" Street Cars?*

By J. G. Holtzclaw

Eastern Texas Electric Company, Beaumont, Tex.

BRIEFLY, the answer to this question might well be expressed in the form of another question, namely, "How far shouldn't we go in dressing up street cars?"

Every company is naturally limited by the amount of money that it can logically spend for this purpose, but if this limitation does not exist there is no other limitation except that of reasonableness. No one would be expected to provide facilities of comfort and luxury that are prohibitively expensive, either as to first cost or maintenance. Nor would they be expected to add frills and furbelows which simply make a street car look pretty but do not tend to improve either riding qualities or attractiveness.

There are two fundamental reasons why effort and money should be spent in making our street cars comfortable and good looking: First, for the drawing power of a good-looking piece of equipment. Second, the attitude that good equipment creates in the mind of our patrons as to our desire to give them the best possible ride for their money. Both of these reasons are sound. Some operator might say that the expenditure of money on painting, on seats, no noise-reducing devices, etc., is not a good investment, and that people will ride on a dilapidated piece of equipment just as readily as on a fine looking, up-to-date car. An operator who holds to this belief, however, is losing valuable time and probably a good many dollars.

This is a day of luxury, as undoubtedly all of you have heard a great many times during the past five years, and the working girl who is willing to spend a fourth of her weekly income for silk hose is certainly willing to spend 10 cents to ride in a first-class street car rather than 5 cents to ride in a dirty, rattle-trap piece of equipment on a rough track.

And right at this point enters the soundness of the second reason given, that is, the attitude it creates in the mind of our patrons as to our desire to give good service. The time is here, and has been for some time, when the street railways of the country must reach out for a new fare schedule. Many of them have already done so; others are in the making today. If our patrons feel that we have made an honest effort to give them satisfactory service with well-maintained equipment, they will be in a far more receptive mood to meet our requests for further increase in fare.

Improve Public Relations

One company in the Southwest has been successful, since the last meeting of this body, in obtaining a new schedule of fares through unanimous action of the city government and without the opposition of the people. The outcome of this company's request for increased compensation is one of the outstanding features for the past twelve months in railway circles, and should be a lesson to all of us as to how we should conduct our business if we are to expect the kind of treatment at the hands of governing bodies that we must have if we are to succeed.

This company, for several years past, has foreseen the necessity of increased rates, and its every effort has been toward keeping its equipment and track in excellent condition, properly maintaining its cars, dressing up to every reasonable degree—to the end that its patrons should realize that the proper portion of their money was going into the upkeep of equipment.

Another company in the Southwest has had a program of dressing up, which has extended through the past two years. It is difficult to estimate or even to state positively whether or not this program has resulted in more passengers, because the city in question has been quite prosperous. But in the face of declining railway revenue during the previous four years, this company, during the past two years, has experienced a constantly increasing revenue, and at this time its street car receipts are running approximately 10 per cent ahead of 1926, and 15 per cent ahead of 1925.

Improvements Made

The schedule of dressing up has not been extremely expensive, and every dollar that has been put into this work is being made effective either in appearance or comfort. All cars have been put through the paint shop, and have been painted, both inside and out, in attractive colors, vastly different from the old standardized yellow or green. Different seats have been provided, finished either in leather or some substitute far superior to the old wood slats. The floors have been covered with linoleum, substituting for the old unsightly wood floors, which could not be kept clean by any method. All fittings on the interior of the cars have been nickel plated. Inside frosted lamp globes have replaced the old glary clear globes.

Everything possible has been done to eliminate noise in operation, but right here it is realized that improvement in this respect can be carried still further to a very good advantage. The particular company in question has a program for 1927, involving only a few thousand dollars, but carrying on still further the work which has seemed to bring a noticeable element of success, and it is likely that it will be continued on and on in the fight which all of us are waging, with our backs against the wall, to keep all of our business from being swallowed up by the drastic competition of the privately-owned vehicle on rubber tires.

No one can answer with authority the question which is the subject of this paper, "How far should we go in dressing up street cars?" because no one yet has had sufficient experience to indicate a limitation. It is to be a matter of experiment. The famous Grand Rapids case has met with some degree of success. Whether the expenditure is justified I do not know, but Grand Rapids has made a name in the history of American street railway transportation, and in the mind of its patrons the Grand Rapids company very likely has a position that can hardly be duplicated anywhere.

To sum it up, we have two primary incentives for improvement: First, to get back some of the business which we have lost by giving our patrons a clean, comfortable, attractive vehicle to ride in. Second, building up in their minds the feeling that their street railway company is trying against great odds to provide the public with good facilities, the psychology of which being that when the time comes for you to ask the public to give you more revenue, you will meet with a ready response and a wholesome co-operation rather than the swift kick which has so often been the lot of the poor railway.

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*Abstract of a paper delivered before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

When the American public feels that it is being treated fairly, it generally responds in a similar fashion; and if called upon to erect an idol for national worship, it would probably erect a gigantic figure which it would label, "A Good Sport."

Research Activities and Production Welding Discussed

NUMEROUS contributions were made to a symposium of the research activities in the welding field during the past three years by speakers at one session of a three-day meeting of the American Welding Society held at the Engineering Societies Building, New York, on April 27-29. At another session there was a symposium on production welding, including papers on thermit welding work, by J. H. Deppler, Metal & Thermit Corporation; a discussion on the field for replacing castings by welded structural parts, by J. F. Lincoln, Lincoln Electric Company; recent applications of arc welding to construction of houses and buildings, by C. J. Holslag, Electric Arc Cutting & Welding Company; oxyacetylene welding of furniture, by M. F. Bayer, Simmons Company, and applications of welding to automobile manufacture, by Robert Appleton, engineer of the Pierce-Arrow Manufacturing Company.

The first day was taken up by reports of various welding committees. H. M. Hobart analyzed and discussed the results of tests made by the Emergency Fleet Corporation in connection with arc welding. In the afternoon there was a meeting of the American Bureau of Welding, at which C. A. Adams, director, presided. Research work of the committee was reviewed, plans laid for future investigations, and officers elected.

Following the precedent of last year a dinner-dance was held at the Hotel Commodore on Thursday evening, April 28. At this the newly-elected officers were announced. These are F. M. Farmer, president; J. H. Edwards, senior, vice-president; R. L. Shepherd, Birmingham, Ala., and G. O. Wilson, San Francisco, divisional vice-presidents. J. J. Crowe, New York City; W. H. Gibb, Bay City, Mich.; H. S. Smith, New York City, and W. C. Swift, West Alexandria, Ohio, were elected to the board of directors.

Telling the Company's Story to a New Man*

By C. A. Brann

General Superintendent Eastern Texas Traction Company, Beaumont, Tex.

ABOUT eight months ago I was sent to Beaumont as superintendent of the railway system. I wanted to know, when they asked me to tell the transportation story to the public, "what is the transportation story?" I thought for quite a while about that particular thing, and it occurred to me that we in our industry were giving men jobs rather than seeking men for the industry. We have a superintendent of transportation who does all hiring and all firing. But in our little company we have another proposition which is quite different, and because it has worked out and because I believe in it, I am going to give you my idea of the transportation story as it should be given to employees.

You may agree with this story and then again you may not, but every green man who goes to work for our company—or rather, before he is regularly employed, before he goes to work there—is told this story; is given at least one-half to three-quarters of an hour's talk on the transportation industry. And these are practically the words that I use when I sit across the desk from him and talk to him about our business:

"The people of this community have granted us a franchise, and through this franchise we obtain the right to operate a transportation service in this city. We must carry the people where they want to go, when they want to go. It is our moral as well as our legal obligation to carry them safely on schedule time and courteously. We have a great many rules in this company. There must of necessity be many rules. There is a reason for every rule that we have. If there is no reason for the existence of any rule, we want you to tell us about it and we will get rid of it. But while we have many rules, they are all based on three fundamental principles; that is, that we must so operate our cars that we will carry the people safely, that we will take care of the people in the streets who do not take care of themselves, and that our patrons will want to ride with us again. The street car is not a has-been, it is a thing of today, a thing of tomorrow. The transportation of our city depends upon the good service that we must furnish.

Street Cars Best

"There is no facility that can take care of transportation as well as street cars. Buses are used, are necessary in some places, but will not and cannot displace the street cars. When a circus was in town, we carried 45,000 people on 45 street cars. Now imagine how many buses would be needed to carry that many persons to and from the places they were going to on that day.

"I want you to know this story because there are some people on the outside—I mean outside the company—that feel that the buses have come to displace street cars. They have not. What may happen 25 years from now, you and I cannot tell. But today there is a very definite need for street cars. In this business there is opportunity for you. It is not a thing of the past, but something for the future.

"No matter how many automobiles we get, we cannot conceive of every family having a sufficient number to take every member wherever he or she wants to go when they want to go. So you have an opportunity; you are starting into a business that is a good, clean, square American business. We want clean men with us, men who will treat other employees, the company and patrons with respect and courtesy. We expect and we are entitled to receive from people who expect us to give service a fair return upon the capital we have invested in order to supply the service.

There is no secret about this business. It is open and aboveboard, and I want you to tell this story to the people as we tell it to you. You may go as high as you can and are willing to go. The manager, the division manager, started as you start today. He did not get to the top by standing on the corner and wishing, but by being attentive to his business, by watching his job and knowing his job. We in this business would rather save character than cash, would rather build brains than brawn. The more you learn, the better we like you. The better you get along with the public, the better you get along with us."

We Have Service to Sell and It Must Be of the Best

That is about the story our men get. We tell it to the supervisors and all the transportation men. Or we tell them further that in this business we have something to sell—it is service. We must produce the proper kind of service before we can expect any one to sell it. Therefore if they will see that it is properly produced they will be able to sell it. Do they do it? During the month of March one of our supervisors, unsolicited, went out after his regular work and sold special car business to the amount of $84. During the month of April the same man sold to the amount of $110. He did not get any extra pay for it other than the satisfaction of knowing that he was doing his job well.

Now when it comes down to the discussion of telling the story to the public by advertising means, you can write ream after ream to the newspapers and magazines; but the most beneficial is the story you tell to the public through the service you give and the manner in which you give it.

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*Abstract of remarks before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

New England Street Railway Club May Meeting

HON. LEWIS GOLDBERG, Commissioner of Public Utilities of Massachusetts, will address the New England Street Railway Club at its next meeting, on Thursday, May 12, at the Copley Plaza Hotel, Boston, Mass. "Radio Broadcasting" will be discussed in the afternoon session by C. W. Horn, superintendent of the radio operation of the Westinghouse Electric & Manufacturing Company. The session will convene at 3:30 p.m.

The News of the Industry

Peace Restored in Scranton by New Wage Agreement

The dark clouds that appeared for a time on the horizon of the Scranton Railway, Scranton, Pa., in the nature of a strike threatened by the Scranton Division of the Amalgamated Association have been dispelled and both parties are again bound by contract to provide service for the 100,000 people who use the street car and bus daily.

An agreement was reached on April 25 continuing the old working conditions and authorizing an increase of 1 cent an hour in all departments. The present wage scale, in cents per hour, is as follows: First three months, 57; next nine months, 62; after one year, 65, with an 8-cent differential for one-man operation.

The contract that bound the railway and the Amalgamated Association expired March 31. Negotiations were commenced on March 18 looking toward a renewal of the contract embodying an increase in wages and better working conditions. The demands of the men totaled an additional expenditure of $210,000 a year. Daily conferences were held until March 31, on which date it was agreed to continue negotiations with the view of arriving at some mutual agreement rather than strike. A precedent was established in the Lackawanna Valley when the union men continued daily operations after the expiration of their contract without any definite understanding of agreement or arbitration.

L. F. Harte, business agent of the local union organization, and H. H. Darte, vice-president and general manager of the railway, were the rival leaders in this campaign. J. D. Keator, managing editor of the Scranton *Times*, was responsible for calling several meetings with the idea of further arbitration.

Transportation Before United States Chamber of Commerce

With the new business era as its main topic the fifteenth annual meeting of the Chamber of Commerce of the United States, held in Washington, D. C., May 3-5, went on record as unalterably opposed to governmental interference with business. In his opening address John W. O'Leary, president of the chamber, declared that by self-regulation American business is bringing about a condition which will result in fewer restrictions being imposed upon private enterprise and initiative through governmental regulation.

The outstanding feature of the manufacturers section was the declaration by Arthur T. Morey, general manager of the Commonwealth Steel Company, that America would sell itself to the world by recognizing that every worker was entitled to life, liberty and the pursuit of happiness in its broadest adaptation.

At the meeting of the transportation and communication group the consensus of opinion was that the merchant marine should be sold to private interests as soon as practicable, and that the chambers of commerce throughout the country should in every way assist in exploiting the air mail service. A. J. Brosseau, president of Mack Trucks, Inc., discussed the relation of the bus and truck to city transportation and the railroads. In discussing the matter of competition with the railways from the bus and inland water carriers, George D. Ogden, traffic manager of the Pennsylvania Railroad, said there was a growing demand for all forms of transportation and that it was his belief that what is good for the community is good for the railroads; what is not good for the community is not good for business.

Among other topics discussed were the regulation on the height of skyscrapers, conservation of natural resources and the Mississippi flood situation. In this latter particular the chamber issued a challenge to the engineering skill of America to see that there were no repetition of the present disaster.

The meeting will be reported at length in the ELECTRIC RAILWAY JOURNAL for May 14.

Chicago Men Hear President Sawyer

Stimulating Address Made by Association Head at Annual Gathering of Surface Lines Employees—First Duty Is to Carry Citizens of Community

INSPIRATION for electric railway employees everywhere was contained in an address made recently by W. H. Sawyer, president American Electric Railway Association, before the Chicago Surface Lines Club in annual session. Mr. Sawyer said in part:

> Generally I have spoken as president of the American Electric Railway Association from a national viewpoint of our industry rather than from any particular local viewpoint. You are, of course, all interested in the industry nationally, but your particular interest is primarily local to your own company and your own community, and I can confine my remarks primarily to your local situation.
>
> I believe that I am normally an optimist and I like to think and talk optimistically, and, frankly, I have every right to be more optimistic about the Chicago Surface Lines than I have about the average electric railway. Others may be trying as hard as you are trying, but, due to local conditions, are not able to accomplish the results which you are accomplishing. The results nationally are, however, encouraging, especially on those properties which are meeting the changed conditions of today with modernized equipment and modernized methods.
>
> Why is it that Chicago made such a splendid record in 1926? There were many contributing factors. Your management has a distinct realization of the responsibility which rests upon it. It fully appreciates to what extent this community needs transportation. More than that, it appreciates to what extent this community needs electric railway transportation. It has not dodged its responsibility to its community, but has gone forward with a determination to carry on and be the asset to this community that it should be.
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> I believe that our duty to our community requires that, first of all, we be transportation men to transport the citizens of the community in the most efficient manner at the lowest practicable cost. I say that we should, first of all, be transportation men—not electric railway men—now, that is definite, but too many of us have used buses where we had no business to use them for the best interests of the community, and it is indeed reassuring to note the results where practically no buses have been used.
>
> While the number of passengers on the Chicago Surface Lines increased, the number of passengers carried by the Chicago Motor Coach Lines decreased in 1926. I think that gives a picture worthy of careful thought. This brings me face to face with the disheartening phases of the Chicago situation from the community standpoint. There should have been more buses in operation in Chicago in 1926 than were operated. These buses should have been operated in co-ordination with the electric railway cars, both surface and elevated. I believe in the bus as an efficient transportation tool which makes possible far better transportation facilities than would ever be possible with the electric car alone, but, on the other hand, it is absurd and ridiculous in the extreme to give serious thought to buses attempting to supplant the electric surface cars of Chicago. The electric street car must remain as the backbone and foundation of your transportation system. The electric car is a necessity; the bus is a most helpful adjunct.
>
> There are, however, other situations where under today's conditions the bus can take care of all of the traffic better than can the electric car. This is true in Belleville, Ill., a city of about 25,000 people, where we have discarded street cars and are using buses entirely on the local city lines and are covering with the buses more territory than was previously covered by the street car lines. The electric cars which we discarded never paid their way and it is doubtful whether the buses will pay their way. There are other small communities akin to the Belleville situation, where there is an obligation to continue service, and where the losses with bus operation will be less than with railway operation.
>
> Your street railway situation is a community problem, which should be solved for the benefit of the community. I have a host of friends who are politicians. I find no fault with a man for being a politician, but I say to them and I say to you that this is not a political question. This is a business man's problem, which must be solved for the benefit of your community. I say that every day's postponement in solving this problem is detrimental to your community.
>
> What do the electric railways of Chicago ask in the settlement of this problem? They ask that the problem be so solved that they can secure the money necessary to do those things which are needed for the benefit of the community. That covers all and everything that they are asking. They are not seeking to make an abnormal profit.
>
> It is true that they, in effect, ask an indeterminate or revocable franchise. The underlying theory of the revocable permit is tenure during good behavior. It affords protection to the public and the community served. It permits a permanent financing program. It would prevent receivership of a going concern. Everybody would be benefited. Nobody would be harmed. The railways could, undoubtedly, accept a franchise that was fixed as to time and limitations, but the people of Chicago should not be asked to pay the cost under such a franchise. It would be an economic waste.

Analyze every suggestion which the railways have made in connection with the solving of this situation and you will find that what they are doing is to point out the efficient way by which they can furnish needed, essential transportation to the community, and when the railways object to provisions which politicians desire to inflict upon them, they rightfully object because the community cannot carry that handicap.

Knowing the situation as they do, your railway executives and bankers would not be true to their trust if they accepted these handicaps which would prevent them from furnishing efficient, comprehensive transportation such as this community desires and must have. I have no doubt but that terms could have been arrived at a long time ago if, as has at times been insinuated, the financial interests behind these properties were simply looking for personal financial gain. These men are honest, responsible business men seeking as community builders for a firm foundation to enhance the community welfare.

I review these local conditions because, knowing them as I do, I feel the obligation to point out to you that you have a duty which you should not and cannot escape. You know the facts. You know that the people you are working for are honest; you know that they know what to do and how to do for this community; you know that they are willing to do and you are their representatives, each and every one of you. You are the salesmen who must go out and give the facts and tell the truth to your friends, to your neighbors and to the people of this community.

Your executives, in spite of all they have done and the high opinion you have of them, have certain limitations. They cannot achieve the impossible; they cannot force men who have money to put that money into the transportation needs of Chicago, unless those men having money are assured that their property will not be confiscated and that they are making a wise investment. Every time there is any objection raised to any provision asked for by the railway, analyze it from that standpoint. It is all right to discuss rapid transit extensions and subways. It is perfectly proper to estimate, study and analyze, but before anything real is done toward appreciable extension of rapid transit facilities existing transportation facilities must be co-ordinated and the first step is the placing of the electric surface transportation on a healthy, solid foundation.

Your problems are interesting. There never was a time when there were more interesting problems to be solved in city transportation; there never was a time when there was more need of the maximum of skill and ability in our industry. Today is a different day, and we must have not only different cars, car equipment and different methods, but we must be up on our toes and doing as never before. If we are to meet today's conditions we certainly must think in conformity with the age in which we are living. If there is one excuse more than another that I personally object to—on our own property—it is to be told that they are doing something today because that is the way we always have done it. We most do things today in the best way to meet today's conditions, after analyzing and studying the conditions. Street car riders—actual and potential—are our customers. We must give them not only good service but we must treat them politely and courteously, just the way any good salesman treats a customer or a potential customer. Please do not think that I am assuming that you are not doing these things. All of us need all the inspiration we can get to do the kind of a job that needs to be done. Your company is going forward today because of the co-operation, skill and ability of this group assembled here. You have every right to be proud of what has already been accomplished, and you are particularly fortunate in that you can look ahead to even greater accomplishments. The day must come when the clouds will roll away and the Chicago traction problem will be settled on a basis helpful to your community, helpful to your company and helpful to you personally. The day will come when community welfare will rise above politics.

New Parlor Car Trains for Summer Service Out of Chicago

Increased summer service on the Chicago, South Shore & South Bend Railroad has been provided in a new schedule which became effective April 24. Seventy-two fast trains are now operated between Chicago, Ill., and Gary, Ind., providing half-hour service throughout the day, and 40 limited trains daily between Chicago and South Bend, Ind. The new schedule shows three additional trains between midnight and 6 a.m. Two new parlor-observation car trains were also added, giving patrons parlor or dining car service on twelve limited trains daily.

Wages Increased 5 Per Cent in Brooklyn

Directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., have approved the recommendation of W. S. Menden, president, that he be authorized to modify existing agreements with various groups of employees so as to provide for approximately 5 per cent increase in wages and a two-year extension of the period in which the present agreements are effective. This approval was with the understanding that the increase be made effective as of the first day of the payroll week in which the new agreements are signed.

As a result, agreements making increases in pay effective as of April 15 are made with following groups:

Motormen and conductors of the surface lines.

Ticket agents, conductors and trainmen, and porters on the rapid transit lines.

Shop, power house, substation, line department, track division and building division employees.

The modification of the wage schedules at this time, in advance of their expiration, is due to an understanding that if there were changes in wages by other transit companies in New York City during the year the representatives of the employees would have the right to seek a modification of the agreements as to wages in advance of their termination date. After the recent announcement of the increase in wages for employees of the Manhattan transit companies, the representatives of various groups of B.-M.T. employees requested conferences with the company officials and asked for an increase in the hourly rates of pay.

Agreements providing for an increase in wages of approximately 5 per cent for employees of the Brooklyn City Railroad have also been completed between representatives of the employees and Clinton E. Morgan, vice-president and general manager of that company. This wage increase is effective as of April 15. The new agreements provide that the new scale of wages shall remain in effect until August, 1929.

Surface motormen and conductors of the B.-M.T. now receive 52 cents the first year, 54 cents the second year, 57 the third year, 60 cents the fourth year and 65 cents the fifth year and thereafter. Elevated trainmen receive 52 cents the first year, 53 cents the second year, 55 cents the third and fourth years, 56 cents the fifth year and thereafter. Elevated conductors receive 59 cents the first two years and 60 cents the third year and thereafter. The differential for one-man car operators is 5 cents. The conditions under which the rapid transit motormen work are contained in a separate agreement which has not been altered.

Adjournment of Legislature Menaces Chicago Settlement

If the present Illinois Legislature fails to pass legislation permitting the consolidation of the surface and the elevated lines of Chicago, together with subways and feeder buses, and authorizing the granting of an indeterminate type of franchise and other fundamentals of ordinances now pending before the City Council and tentatively agreed upon by the city and companies, a delay of nearly two years in the settlement of Chicago's troublesome local transportation problem appears inevitable. Even should the expired surface lines franchises be extended again on July 31, needed extensions and new construction would be indefinitely postponed and not even a beginning could be made toward the much-desired subway construction. That is the concensus of opinion now existing both among city officials and traction experts.

With the present session of the Legislature set for adjournment early in June, immediate presentation of the enabling bills must be made. Such action has been forestalled by the failure of the local transportation committee to meet in nearly three months, by the intervention of the mayoralty election last month and by the subsequent refusal of Mayor Thompson to discuss officially any proposal he may have for a solution of the problem. Rumors that the Mayor had reached an understanding with Samuel Insull, president of the Chicago elevated lines, for the consolidation of elevated, surface and bus lines into a unified transit system under the latter's management have been vigorously denied by both men. The purpose of a later meeting between Mr. Insull and Samuel Ettelson, newly appointed corporation counsel, has been kept a secret.

The only expression it has been possible to obtain from Mayor Thompson since his return from his election "victory" tour of the South is that he desires immediate action in the matter and that while he is still inclined to favor his original idea, providing for a transportation district to acquire and operate the surface lines, which was defeated in the state Senate some years ago by a narrow margin, he will consider other plans with an open mind. He has declared that, in any event, the final decision will rest with the people of Chicago, since he would insist on a referendum on any traction ordinance passed by the City Council. He is said to be no longer committed to the municipal ownership theories he once favored.

Seeks to Discontinue Weekly Pass in Terre Haute

In a petition just filed by the Terre Haute, Indianapolis & Eastern Traction Company permission is asked of the Indiana Public Service Commission to discontinue the $1 weekly passes at Terre Haute. The petition says the people of the city abuse the pass by using it to get on the car and then by handing it out the windows to other persons. Besides, confusion resulted from the necessity of making the passes a different color each week.

Arbitration of I.T.S. Wages

William Atkins, United States Commissioner in St. Louis, Mo., has been selected as the third member and chairman of the arbitration board which will consider the matter of a new wage scale for the Illinois Traction System. Hearings will begin on April 5 and will be held in St. Louis, Mo., and Springfield, Ill.

The old contract of the trainmen with the Illinois Traction System expired on Dec. 1, 1926. Prior to that time a committee representing the workers had asked for increases in the wage scale. The company has contended that conditions warranted a decrease.

Failing to agree among themselves, both sides decided to submit to arbitration, as provided in their previous contract. W. L. Perry, St. Louis, was appointed to represent the men and E. E. Soules, Peoria, Ill., was named as the company's representative. They selected Mr. Atkins as the third man.

Pending final settlement the men have continued at work under the old agreement, but any change in wages is to be retroactive to Dec. 1, 1926.

Wage Issue in New York State

Negotiations are still under way between representatives of the New York State Railways and of the employees of the lines in Rochester, Syracuse and Utica, N. Y., looking to a new wage and working agreement for the year starting May 1. No announcement has been forthcoming as to progress save that an agreement had been reached on the working conditions.

The real issue, the wage question, is still being threshed out in conferences. The union is demanding a straight 9 cents an hour increase for all employees in the three cities. Motormen and conductors on city lines now receive 55 cents an hour; one-man car operators, 60 cents, and interurban operators, 58 cents.

The railway has contended that despite increased fares in the three cities, the demands for improvements have increased in proportion and mounting cost of operation prohibits a wage increase at this time.

In the event no agreement is reached by May 1, any settlement made after that date will be retroactive.

Buffalo & Erie Wage Issue to Be Arbitrated

The proposed 10 per cent wage reduction in the pay of platform and other employees of the Buffalo & Erie Railway, which operates an interurban line between Buffalo, N. Y., and Erie, Pa., will be submitted to a board of arbitration as the result of an agreement made by the company and its employees at a conference in Fredonia between Manager MacLeod of the company and a committee of the employees. The men named Harry Solomon, Erie, as their representative on the board, the company choosing H. L. Mack, former vice-president in charge of transportation of the International Railway, Buffalo, as its representative. These two will select the third arbiter. The men will continue at work pending the outcome of the conferences by the board. It was stated in the ELECTRIC RAILWAY JOURNAL, issue of April 30, page 789, that the company had ordered the wage cut effective May 1.

Fares Changed in Tacoma—Weekly Ticket 30 Cents

As the final experiment pending the digestion of the lengthy analysis and report on the affairs of the Tacoma Railway & Power Company, Tacoma, Wash., about to be submitted to the City Council another change in fares was instituted on May 1.

The outstanding feature of the new fare basis will be a new type of weekly ticket costing only 30 cents, which will entitle the holder to as many rides as he desires at 5 cents additional each, with full transfer privileges. The object of this new fare is to encourage added or convenience riding, and thus increase total revenues by selling more service. In addition to the weekly ticket fare, a single cash fare will be 10 cents and tokens will be sold on the cars at three for 25 cents. It is expected that the new fare basis will not mean an increase in the average fare paid by Tacomans. The 5-cent fare zone is eliminated entirely under the new fare plan. Tokens will not be sold at agencies. Cards good for six rides and selling for 50 cents will be discontinued. School fares have been left undisturbed through all experiments.

Agreement between the City Council and the company was reached after the most amicable negotiations. Richard T. Sullivan, manager of the company, first suggested a 40-cent ticket, but finally, upon suggestion of the city officials, amended it to 30 cents. Under the proposed 40-cent price, Commissioner Davisson pointed out, the man who needs twelve rides a week at the lowest fare possible would pay 8½ cents per ride under the pass fare.

Manager Sullivan is quoted as saying that the revenues of the last two months have been so low that the company would have to increase the token fare from fifteen to thirteen for $1 if the ticket experiment were not approved. The present fare tariff expires April 30 and it would be necessary under any circumstances for the company to file a new schedule with the state by that date. Under the agreement between city and company for the experimental period, the company would have the right to raise fares because revenues have failed to reach the agreed minimum.

W. Kesley Schoepf Dead

W. Kesley Schoepf, president of the Cincinnati Traction Company, Cincinnati, Ohio, which was succeeded by the Cincinnati Street Railway, identified with the Cincinnati Car Company and other local enterprises for many years, died on the morning of May 6. Mr. Schoepf terminated a period of service of 25 years with the traction company in the fall of 1925. He was always very much in the public eye, but none denied the power of the man as a constructive force that had done much to enrich the local community.

Phoenix Voters Approve Bond Issue

The proposed $750,000 bond issue for the complete rehabilitation of the Phoenix Street Railway, Phoenix, Ariz., was carried at the special election on April 30 by a 95 majority vote. An ordinance calling for the special election and approved by the City Commission calls for the purchase of new cars, rails, ties and other necessities for bringing the present municipal railway up to date. It means the rehabilitation of the entire system. Under the plan the system will be operated for a period of five years before the sinking fund provided to amortize the payment of the principal of the bonds begins to function.

The city of Phoenix acquired the properties of the railway by purchase on June 4, 1925, for $20,000 and assumed direct operation on Nov. 1, 1925.

Lincoln Interurban Authorized to Charge Ten Cents

The Omaha, Lincoln & Beatrice Railway, Lincoln, Neb., has been authorized by the State Railway Commission to increase its car fares to the level charged by its competitor, the Lincoln Traction Company. That rate is 10 cents for cash fares and four tokens for 30 cents, with 2 cents added for rides beyond the 45th Street zone. It has been charging 6 cents cash, with 1 cent additional for zone rides. Its revenues in 1926 from carrying 489,976 6-cent passengers and 308,130 1-cent riders was $32,479. The company was also authorized to make its bus rates the same as its competitior, 10 cents cash, with 2 cents additional for first zone and four tokens for 30 cents.

The commission finds that operation resulted in a deficit in 1926 of $3,206, which is larger than any year since 1923 and $2,500 more than 1925. While revenues have increased nearly $2,000 expenses have gone up $5,500. The company has never paid expenses. The present value of the property is $300,000, not including $89,000 spent for grading a roadway upon which tracks were never laid.

Seattle and Aberdeen Perfect Car Designation Signs

Mayor Bertha K. Landes of Seattle, Wash., has promised that a system of numbering and lettering street cars, so that each car will show more plainly the designation of its route, will be put into effect as soon as possible. The principal complaint now is against the position of the numbers ahead and from one side of the cars. It is proposed to broaden the narrow scope of visibility by placing boxes on top of the cars, with the numbers displayed in large type on all four sides. The cost of putting the boxes on the cars would be $10 a car, it is estimated.

The Grays Harbor Railway & Light Company of Aberdeen, Wash., is also completing a system of designating the cars by colored lights, so that persons wishing to board a car can identify it easily. As soon as the work is finished, each car will carry two colored lights showing the destination.

Seniority Rule Demanded in Seattle

Unless the seniority rule be made effective on the lines of the Seattle Municipal Railway, Seattle, Wash., a tie-up of the railway system is threatened by the local branch of the Amalgamated. If the Civil Service Commission does not accede to the demands of the union a strike vote will be taken. The issue was raised the first of the year, when twenty employees of the municipal lines were laid off, under the combined efficiency and seniority rules in vogue in all city departments. The union head demands that the last man employed be the first to go. Protest was made to the commission, which has finally voted in favor of its present system, with the resultant threat of strike. Tom S. Patterson, chairman of the Civil Service Commission, characterizes the issue as "a tempest in a teapot." He declares the men laid off were slated for the layoff under the system by which an average of an employee's last two efficiency ratings is taken, then a half point added for each year of service up to ten years. He states that nearly all the men laid off from steady employment have had part-time jobs, and will undoubtedly be restored to full time eventually.

News Notes

St. Louis Argument on May 17.—The Missouri Public Service Commission will hear arguments on May 17 on the intervening petitions of the city of St. Louis and University City against the latest application of Receiver Rolla Wells of the United Railways for an 8-cent fare. It is probable that when the case does come up the entire valuation controversy will be gone over again. Special Master William Igoe has advertised the sale of the United Railways properties under foreclosure proceedings for May 25.

A Public Relations "Get Together."—A "Fellowship Dinner" at the Pleasant Valley Country Club, Connellsville, Pa., on March 11 knitted even more closely the relationship between the West Penn Railways and the community life of that section, known as the heart of the West Penn System. The speakers at the dinner told of the beginnings of the corporation's business. It was revealed that the West Penn believed in the future of Connellsville and has testified to this faith by locating more of its staff and operations in that center. The latest contribution is a new terminal station and office building for the West Penn Railways, on which construction is now under way.

Seeks Namesake's Records.—Leningrad, formerly St. Petersburg, Russia, through its city engineer, has sought the records of the city of St. Petersburg, Fla., to be deposited in the town museum. R. E. Ludwig, director of utilities of St. Petersburg, has been asked to send complete data on the municipal railways of St. Petersburg, the number of passengers carried yearly, "tramways and other urban and suburban railway, cargo, wagons, kilometers and casualties." J. Clark, engineer of Leningrad, said that the material on St. Petersburg, borrowed from periodicals and special literature, was insufficient for their needs. Director Ludwig said the data would be prepared and sent by registered letter to Leningrad.

Boston Takes Up Question Fad.—"What do you know about the El?" is a new department of the *Co-operator*, published by the Boston Elevated Railway, Boston, Mass. It consists of 25 questions covering the history and operation of the Massachusetts property. In the April issue 25 more questions supplementing those asked in the previous issue are published, together with the answers to the March queries.

Strike Formally Ended.—The strike of 29 employees of the Danbury Power & Transportation Company, Danbury, Conn., was declared ended on April 26 by the employees. The employees left their places on Nov. 23, 1926, when they were denied a new agreement. Buses have been operated over the company's lines since that time. Practically all the strikers have secured new positions. The vote was merely a formality.

Wages of Trenton Men Increased.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has granted an increase of 5 cents an hour to its employees. The agreement, retroactive to April 1, gives the men a 1 cent an hour wage increase in 1927, an additional 2 cents an hour increase in 1928 and another 2 cent advance in 1929. Previously wage agreements were made for a period of one year only. The three-year progressive increase contract was reached at a conference between General Superintendent Edward J. Peartree and railway employees.

Reorganizing Railway Departments.—The 3$\frac{4}{10}$ per cent increase in net earnings of the city of Detroit, Department of Street Railways in March, 1927, over 1926 is explained by Del A. Smith, general manager of the Michigan line, by the fact that approximately 100 employees have been dropped from the payroll during the past 30 days. These dismissals have been in the line, track, mechanical and office departments, and in several instances high ranking jobs have been absorbed by other departments. Among the positions that have been abolished and the work absorbed bv other departments are the employment manager, superintendent of traffic and assistant electrical engineer.

New Routes Recommended.—Abandonment of three one-man railway routes of the Washington Railway & Electric Company, Washington, D. C., and the substitution of three other routes were recommended on April 14 by R. G. Klotz, engineer for the Public Utilities Commission. The company has agreed to the proposal and a hearing will be held shortly. In the meantime the commission is planning to obtain opinions from patrons on the proposed changes. Trackage on practically all the lines will remain unchanged. Mr. Klotz said that the present routes never had been considered entirely satisfactory, but had been allowed to continue for several years in order to observe the development of each and so determine what changes finally would prove desirable.

Electrification of Lines Proposed in Maritimes.—Addressing employees at Moncton, N. B., recently, Sir Henry Thornton intimated that the Canadian National Railways would investigate the possibilities of power development in New Brunswick, with particular relation to the Petitcodiac project, in an endeavor to discover the prospects of electrification of lines in the Maritimes.

Newly Painted Cars in Parade.—Ladies in their new Easter raiment this year did not have everything their own way in Baltimore, Md. The United Railways & Electric Company came in for a share of the applause. Several newly painted cars had an important place in the Easter parade that took place on Charles Street, attracting the attention of the thousands who celebrated on Easter. The United is experimenting with color combinations for its cars and the public will decide which it likes best. The cars are being tried out on various lines which operate through the center of the city.

Bargains and Free Rides in Nashville.—Free rides were granted to visitors to the Lebeck Store in Nashville, Tenn., on May 2, when Lebeck Brothers celebrated their 53d anniversary. Special anniversary street cars were run on all lines on a regular schedule. Thousands filled the four spacious floors of the big Lebeck building for the big sale, carried thither by the Nashville Railway & Light Company without discomfort. In addition, any Lebeck customer who desired to drive into town in his car was permitted to park it in the big fireproof Northern garage and leave the vehicle there during the day on as many of the sale days as desired, free of charge the only requirement of this privilege being that the owners are customers at the sale, which comes to a close May 14. Large cash prizes were offered and opportunity was afforded of adding coupons to some worthy charity.

Settlement in Kingston.—Railway lines operated by the Kingston, Portsmouth & Cataraqui Electric Railway in Kingston, Ont., will continue to operate despite the announcement that that would cease on April 30. Through the Board of Trade a conference was held between the Public Utilities Commission and the railway officials and a settlement was reached whereby the commission will pay the railway $15,000 besides crediting as paid all power accounts up to May 1, 1927. Awaiting the settlement the railway has paid no accounts for fifteen months. The $15,000 will be invested and used if necessary in meeting annual deficits in operating expenses or interest on debentures. The company will improve its roadbed and will operate, if the money just paid will allow, until July 1, 1934, when a new agreement and a new franchise will be negotiated. The matter was brought to a head by a demand of the Ontario Utilities Commission for a rate for power of 6.5 cents per kilowatt-hour. The railway refused to consider any such demand.

Recent Bus Developments

Awaiting the Good Old Summer Time in Atlanta

Although the Georgia Power Company, Atlanta, Ga., does not guarantee to make the sandwiches, open the olives or keep the ants out of the pie, it nevertheless has put in operation a plan which is at once a boon to picnickers and a profit maker for itself. That plan is to supply fifteen double-deck coaches, each with a capacity of 60 persons, to picnic parties on afternoons and evenings during the summer at moderate prices. As the company effectively says in advertising its new picnic coach service to the public:

> The big, comfortable coaches mean that your entire party can journey to the picnic grounds together. There's no worry about whether there will be room for Susie in Uncle John's car, or whether she will have to sit on the cake in the tonneau of brother Joe's machine. When you are ready to return, there's nothing to do but load up the coach and start. An automobile large enough for every one makes the party much more congenial and adds just about 50 per cent to the pleasure of the trip.

All that the company asks is that it be notified when the coach is wanted and where the party wants to go, and it will do the rest. Special efforts are being made to rent out coaches for Sunday school picnics and straw rides.

Indianapolis Coach Deal Up on May 9

Formal hearing before the Indiana Public Service Commission on the application of the Indianapolis Street Railway to buy all the assets and franchise rights of the People's Motor Coach Company for approximately $650,000 will begin May 9. Because of the importance of the case, Frank T. Singleton, commissioner in charge, said the entire commission will be present and the hearing will be held in one of the legislative chambers. In the transaction the railway seeks authority to issue ten-year notes amounting to $500,000. These notes are to be sold to raise money with which to buy an equal total of the stock of the coach company. In addition the railway will assume the present outstanding indebtedness of the coach company.

Opposition Expressed to Southern Pacific Bus Plans

Organized bus carriers of California will oppose bus operation plans of the Southern Pacific Company. Arthur H. Samish, secretary manager of the Motor Carriers' Association of California, so stated in Sacramento following announcement by the railroad that it plans to enter the bus field. As announced in the ELECTRIC RAILWAY JOURNAL, issue of April 30, page 790, incorporation papers were filed in Sacramento April 19 for the Southern Pacific Motor Transport Company. The new company has a capital stock of 1,000 shares of no par value. Its headquarters will be in San Francisco. The officers of the corporation have not as yet been announced. The directors are E. J. Murphy, R. R. Cheever, Theodore Wright and T. B. Wilson, San Francisco, and E. H. Gubbins, San Rafael. Southern Pacific bus lines, it is announced, will replace unprofitable branch lines and will act as feeders for main lines.

It is expected that the bus carriers of the state will oppose the granting of certificates of public convenience by the California Railroad Commission at the time application is made if the route in question is in territory already served by bus lines.

Preliminaries of Bus Regulation in Missouri

Preparations to put into effect rules for the regulation of all bus lines operating in Missouri are being made by the Public Service Commission at Jefferson City. Under a law passed by the last Legislature and signed by Governor Baker the commission assumes jurisdiction over the bus lines on July 3. The commission will first adopt a tentative set of rules and regulations and will then hold a series of hearings for bus company officials before the law becomes effective. Hearings on the issuance of certificates of convenience and necessity and on rates, service schedules, routes and equipment will not be held until the law goes into effect.

Seeing Ottawa

The Ottawa Electric Railway, Ottawa, Ont., has announced that its Gray Line is ready to take care of this season's sightseeing business. Twelve de luxe motor coaches provided with especially comfortable seats will be available for this purpose. The Ottawa-Hull, Connaught Rifle Ranges and Gatineau Valley tours will be operated and will be in charge of chauffeurs carefully selected and trained by the Ottawa Electric Railway. The regular sightseeing tour operated daily last summer through the Ottawa-Hull district will commence early in the month and the other tours will be operated by request or on special days.

Hearing Postponed.—The hearing scheduled before the Public Service Commission on May 2 on the petition of the Capitol District Transportation Company, Inc., for permission to increase its fare from 7 to 10 cents has been adjourned to May 11. This is the bus subsidiary of the United Traction Company, Albany, N. Y.

Petition Denied.—The California Railroad Commission has dismissed the application of the Key System Transit Company for a certificate to operate bus service between Oakland and Hayward and intermediate points. The commission held that the proposed operation over the Foothill Boulevard route would mean a loss which the company could not suffer while business was being developed.

Votes for Buses.—The City Council of Eugene, Ore., voted favorably on the substitution of buses for street cars of the Oregon Electric Railway at a meeting held April 18. The franchise is to be advertised for three weeks before the final ordinance is passed.

New Service Given.—Milton Ellis, owner and general manager of the Rockford Public Service Company, recently instituted a bus-interurban schedule which gave Rockford-Chicago passengers a two-hour-and-35-minute service direct to the loop. The buses left Rockford with direct run to Elgin, stopping only at Belvidere, and connecting with the Chicago, Aurora & Elgin third-rail system. As soon as storm damage to the interurban lines is repaired the Rockford Public Service will furnish hourly service to Chicago.

New Use for Bus.—A twelve-passenger de luxe bus to be equipped with parlor car chairs and to be used in carrying passengers between downtown Detroit hotels and the Ford Airport will be bought from Dodge Brothers, Inc., for the Department of Street Railways, under authorization by the Council on April 25. The coach, according to Del A. Smith, general manager of the Department of Street Railways, will be placed in service within 30 days. It will cost $3,800. It will not be run on schedule, but will be used to meet aircraft arriving at the port. Besides its practical use, it would be of value as an advertising medium for the city's interest in aviation.

Employees Paid for Securing Contracts.—The United Railways & Electric Company, Baltimore, Md., has decided to pay a commission to employees who aid in the leasing of chartered buses and de luxe coaches. It is believed that many employees can help measurably in developing this business. Where employees are members of lodges, church organizations, socials, clubs and athletic teams, which take trips at various periods of the year, a word or a bit of effort on the part of an employee may influence that organization to use the company's buses or coaches. These conveyances may be used for visits to Annapolis, Frederick, Belair or any other point. It will not be necessary for an employee to obtain a definite order to secure commission. When inquiries that have been turned in to the Gray Line develop into orders the employee will be given credit for the commission.

No Action on the Substitution by Buses.—Contrary to expectations, the village board of Elmsford did not follow the Tarrytown officials in refusing to grant the petition of the Third Avenue Railway for the substitution of buses for trolleys on the Tarrytown Road between Elmsford and Tarrytown, N. Y. At the last meeting of the board, when the trolley situation was brought up following the joint meeting of the Tarrytown, Elmsford and town of Greenburgh boards, the sentiment seemed to be decidedly in favor of the continuation of railway service, as the cost of sending some 100 children to the Tarrytown school would prove too great a hardship for the parents without the benefit of commutation tickets and school fares.

Financial and Corporate

3 Per Cent Increase in Chicago "L" Traffic

For the first quarter of 1927 the Chicago Rapid Transit Company, operating the "L" lines, carried a total of 58,881,450 revenue passengers. This was an increase of 1,695,616 over the corresponding three months of last year, or 3 per cent. One of the reasons ascribed for the steadily increasing business of the Rapid Transit Lines is the growing congestion on the city streets. The private automobile is becoming less and less a serviceable method of transportation in the city because of the traffic congestion on the streets and boulevards. This is becoming more apparent in a study of traffic on the elevated lines. On the opening of the baseball season on April 12, for instance, the Rapid Transit Lines collected approximately 11,000 fares on the return trip from the ball grounds. This was twice the number registered on the opening day a year ago. The "L" lands its passengers at the gates of the Cubs park and only a short distance from the entrance to the Sox park.

Morristown Property to Be Sold at Foreclosure

Sale at foreclosure of the Morris County Traction Company, Morristown, N. J., in receivership for several years, was decided upon at a hearing before Federal Judge Runyon. An order authorizing the sale will be presented to Judge Runyon for his signature May 20 by Elmer King of Morristown, counsel for the receivers, Joseph P. Tumulty and Joseph K. Choate. At that time the court will appoint a special master to conduct the sale.

Representatives of Chatham, Madison and Dover and a number of judgment creditors attended the hearing. The attorneys for the three municipalities asked whether taxes owed by the company would be given priority, and received an answer in the affirmative. The trolley tracks will be removed. There will be two different sales. The company's real estate in Morris County will be sold at the Morris County Court House, while the real estate in Union County will be sold at Elizabeth. It is intimated that a committee of security holders of the company will make the purchase. Under a plan now in contemplation buses would be substituted for the railway.

Dividend Omitted by Brooklyn City Railroad

The directors of the Brooklyn City Railroad omitted the usual quarterly dividend of 10 cents a share on its capital stock at their meeting on May 3, after having reduced it from 20 cents last January. They believe the earnings should be put back into property, constantly increasing its value. Frank Bailey was elected a director.

H. Hobart Porter, president, in a letter mailed to the stockholders says considerable delay in any proposed financing must result from the Transit Commission's denial of an application to issue $2,500,000 of 6 per cent general and refunding mortgage bonds. Mr. Porter said in part:

"Your directors determined that it was to the best interests of the company that no dividend should be paid at this time. They feel this suspension of dividends will be a hardship to many, but the earnings are being put back into the property, constantly increasing its value, and this will accrue to the benefit of the stockholders."

Receiver for Empire State Railroad

T. C. Cherry has been appointed receiver for the Empire State Railroad Corporation, Syracuse, N. Y. Announcement is made of the appointment of a bondholders' protective committee, of which A. B. Merrill, vice-president of the First Trust & Deposit Company, Syracuse, is chairman. The Empire State Railroad was unable to provide for payment of interest due May 1 on the Syracuse, Lake Shore & Northern 5 per cent bonds secured by first mortgage on the railway property.

Interurban in Ohio Does Well

Cincinnati, Hamilton & Dayton Reports Balance Remaining After Fixed Charges and Depreciation 55 Per Cent in Excess of Estimates Made by Reorganization Committee

RESULTS of operation of the Cincinnati, Hamilton & Dayton Corporation, Hamilton, Ohio, the holding company for the Cincinnati, Hamilton & Dayton Railway, in 1926 were more favorable than had been predicted. Gross revenues from operation were 1½ per cent less than were estimated, but this was more than offset by economies in operation, which brought the operating expenses to a figure 2 per cent less than was estimated. Net revenues from operation available for fixed charges, depreciation and surplus were 3.07 per cent in excess of predictions. Interest chargeable to operation was materially less than had been thought probable, in consequence of which the balance remaining after charges was more than 30 per cent in excess of that estimated. The accrual for depreciation was about 13 per cent in excess of the amount tentatively fixed at first. After deducting this accrual and giving credit for non-operating income the balance remaining over and above fixed charges and depreciation was 55 per cent in excess of the estimate.

INCOME ACCOUNT, CINCINNATI, HAMILTON & DAYTON CORPORATION

March 9, 1926, to Dec. 31, 1926

Operating revenue		
Passenger and special car revenue	$653,014	
Freight and express revenue	170,689	
Miscellaneous revenue	8,759	
		$832,463
Operating Expense:		
Way and structures	$98,270	
Equipment	61,335	
Power	149,562	
Conducting transportation	264,577	
Traffic	4,381	
General and miscellaneous	148,827	
		$726,954
Net revenue from railway operation		$105,509
Taxes assignable to railway operations		29,322
Operating income		$76,187
Non-operating income		2,394
		$78,581
Deductions from gross income		32,152
Net income before Federal income taxes		$46,428
Federal income tax (estimated)		2,500
		$43,928

The Cincinnati, Hamilton & Dayton Railway took over the 86.2 miles of railway on March 8, 1926, following reorganization.

For the purpose of comparing the results of operation in the year 1926 (including the operations of the receiver from Jan. 1 to March 8, 1926, and for the balance of the year) with the estimate prepared by the management and set forth in letters to the bondholders under date of Jan. 20, 1926, the following comparison has been made:

	Actual Results of Operation —1926*	Estimated Results of Operation for 1926 as Set Forth in Said Committee Letters
Gross revenues from operation	$1,015,325	$1,030,000
Operating expenses including maintenance, rentals and taxes (exclusive of Federal income tax)	885,041	903,606
Balance	$130,284	$126,394
Interest on bonds of operating company chargeable to operation	†30,781	50,000
Balance	$99,502	$76,394
Depreciation accrual	45,468	40,000
	2,394	
Non-operating income	$54,034	$36,394
Balance available for holding company surplus and Federal income tax	$56,428	$36,394

* Adjustments were made in the operating expenses of the property from Jan. 1 to March 8, 1926, to exclude therefrom fees of the receiver and his attorneys, capital expenditures improperly charged to operating expenses and certain small non-recurring charges.

† Includes interest on $350,000 first and refunding Cincinnati, Hamilton & Dayton Railway 6s, 1941; $250,000 Dayton Traction 6s, 1931, and $200,000 Hamilton City 6s, 1931, from March 9, 1926, to Dec. 31, 1926, less interest during construction of $8,151.86 charged to capital.

The balance sheet does not reflect the issue and sale, at par and accrued interest, to the reorganization managers of $500,000 par value of the railway first and refunding mortgage 6 per cent gold bonds. The proceeds from the sale of these securities are now held by the reorganization managers and will shortly be made available to the railway. When this transaction is consummated the railway will have nearly

$500,000 in its treasury. The value of "Road and Equipment," shown as $4,675,890, was based upon an engineering appraisal and is believed to represent the minimum sound value for the property.

Additions and betterments aggregating $397,594 were made during 1926. The more important items in this program were as follows:

ADDITIONS AND BETTERMENTS

Pleasant Avenue track reconstruction	$89,581
Freight facilities at Cumminsville	13,294
Freight and passenger connections to Delco Lignt plant	26,273
Purchase of Miamisburg station property	10,000
Initial payment on account of purchase of 60-cycle automatic substation equipment	95,455
Payments to reorganization managers on account of six new cars for Hamilton city lines and fifteen freight box cars and future liability thereon as per balance sheet	89,922
Expenditures by company in connection with ten interurban cars, ten Dayton-Miamisburg cars, one freight motor and 25 freight box cars	25,014
Paving improvements	13,626
Miscellaneous items	26,273
Interest during construction	8,151
Total	$397,594

"Car trust certificates" represent the balance outstanding as of Dec. 31, 1926, on car trust obligations created by the receiver while operating the Cincinnati & Dayton Traction Company and covering certain rolling stock used on the Hamilton city lines.

The "Depreciation Reserve" item in the balance sheet, amounting to $203,097, is made up of reserves turned over by the reorganization managers to the railway in accordance with the decree of the Court of Appeals of Butler County, Ohio, and accruals for depreciation through charges to operating expenses from and after March 9, 1926.

Immediately upon acquiring title the Cincinnati, Hamilton & Dayton Railway launched a comprehensive plan of rehabilitation, additions and betterments. On Aug. 30, 1926, the reorganization managers let contracts for the construction of six safety-type passenger cars for use on the Hamilton city lines and fifteen freight trail box cars, all of which were delivered during 1926. In addition thereto the managers on Nov. 9, 1926; Nov. 12, 1926, and Dec. 18, 1926, placed contracts for ten one-man, two-men passenger cars for use on the Dayton city lines and in the local service between Miamisburg and Dayton, ten passenger cars for use on the interurban line, an electric freight locomotive and 25 additional freight trail box cars. Plans have been formulated for financing a large part of the cost of this rolling stock by the creation of a car trust.

That the company is fully alive to the freight possibilities is shown by the fact that it has enlarged its Cumminsville freight station at Cincinnati and has installed additional steam and less-than-carload tracks.

So much for the results. Now for a little history. The Cincinnati, Hamilton & Dayton Corporation came into existence by virtue of a certain plan and agreement of reorganization for the railway property of the Cincinnati & Dayton Traction Company, dated Oct. 1, 1925, which was declared effective and binding by the reorganization managers on March 4, 1926. Pursuant to the terms of that plan two corporations were organized by the reorganization managers, viz: Cincinnati, Hamilton & Dayton Railway and Cincinnati, Hamilton & Dayton Corporation.

The Cincinnati, Hamilton & Dayton Railway was chartered in Ohio on March 24, 1926, and acquired title to the railway property formerly owned by the Cincinnati & Dayton Traction company, consisting of (a) an interurban line 53½ miles in length, a large part of which is of double track construction, located largely upon private right-of-way, running from the center of Dayton to the outskirts of Cincinnati, passing en route through Hamilton, Middletown, Trenton, Franklin, Miamisburg, West Carrollton, Mount Healthy and College Hill; (b) a branch line from College Hill to Mount Healthy, 3 miles in length, over which only freight service is now rendered; (c) local railway lines serving the city of Hamilton, and (d) two local railway lines (operating in large part over the above-described interurban trackage) furnishing service to a rapidly growing section of Dayton, Ohio. The interurban line traverses the populous and prosperous Miami Valley. The total population of the territory served, including the cities of Dayton and Cincinnati, was 733,030 in 1920. The various cities and towns served by the property are showing a consistent and substantial growth.

The Cincinnati, Hamilton & Dayton Railway had outstanding as of Dec. 31, 1926, the following securities:

Dayton Traction Company first mortgage 6 per cent gold bonds (extended to Jan. 1, 1931)	$250,000
Hamilton City Division first (closed) mortgage five-year 6 per cent gold bonds, due 1931	200,000
Cincinnati, Hamilton & Dayton Railway first and refunding mortgage 6 per cent series "A" gold bonds, due 1941	350,000
60,000 shares of common stock (without par value) constituting all of the stock issued and outstanding.	

In addition the reorganization managers have subscribed at par and interest for a block of $500,000 par value of first and refunding mortgage series "A" 6 per cent bonds and authority for the issue thereof has been secured by the railway from the Ohio Commission.

The Cincinnati, Hamilton & Dayton Corporation was chartered under the laws of Delaware on May 6, 1926, and acquired all of the common stock, without par value (except directors' qualifying shares), of the Cincinnati, Hamilton & Dayton Railway. The Cincinnati, Hamilton & Dayton Corporation has issued the following securities:

$2,125,000	par value prior debenture 6 per cent gold bonds, due Jan. 1, 1976.
875,000	par value adjustment income gold bonds, due Jan. 1, 1976.
20,500	shares of common stock (without par value.)

The reorganization managers were unable to complete their work during the year 1926, hence no balance sheet was included in the report for the Cincinnati, Hamilton & Dayton Corporation pending a final settlement between the reorganization managers and the corporation upon the completion of the reorganization.

Traffic Fare and Wage Figures

Electric railway passenger traffic increased slightly in March, 1927, compared with March, 1926. The month of March, 1926, however, was a very good month for electric railway passenger traffic and showed a substantial increase over the corresponding month in 1925. It is not surprising, therefore, that March, 1927, has not increase very much over the 1926 figure.

The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 217 companies is as follows:

March, 1927	868,973,115
March, 1926	866,604,853
Increase, per cent	0.27

Average cash fare in cities of 25,000 population and over:

	Cents
April 1, 1927	7.8194
March 1, 1927	7.8194
April 1, 1926	7.6653

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913 = 100 Per Cent
April 1, 1927	56.97	209.06
March 1, 1927	56.97	209.06
April 1, 1926	56.66	207.93

Fredonia Stub Line to Be Abandoned

Upon evidence that the Buffalo & Erie Railway has not taken in sufficient revenue in eighteen months on its East Main Street stub line in Fredonia, N. Y., to pay wages of its car operators, the Public Service Commission approved on April 22 a declaration of abandonment by the company of that part of the Fredonia line running from Temple Street east along Main Street to the Pomfret town line. The abandonment, according to the order, is not to become effective until July 1, 1927, so that provision can be made by local authorities for the transportation of school children.

New York City Road in Receivership

The Eighth & Ninth Avenues Railway, which split from the New York Railways system when the latter went into bankruptcy in 1919, went into a receivership on May 5. Loss of revenue-paying passengers, increasing taxes and the effort of the federal government to reopen income tax proceedings against the company were given as the causes.

The application for the receivership was made by the American Brake Shoe & Foundry Company. Federal Judge Henry W. Goddard named Nathaniel A. Elsberg and Michel Kirtland as receivers. Joseph Tate, president of the company, said that it had been run at a loss for the last eight years and had been using up its available assets in the hope of relief from an inadequate fare and a crushing burden of taxes.

The Eighth Avenue Railway was formed in 1855 and the Ninth Avenue Railway in 1859. Both companies were leased to the old Metropolitan Street Railway for 99 years, but reverted to their owners when the New York Railways, which had assumed the Metropolitan Company's lease, went into bankruptcy in 1919. The two companies were merged last year. The combined company has more than 26 miles of track and about 200 cars.

Earnings and Traffic on the Increase in Tampa

Earnings in the railway department of the Tampa Electric Company, Tampa, Fla., for the year ended Dec. 31, 1926, increased 19.1 per cent. That this increase had a salutary effect upon the combined departments' gross and net earnings was mentioned by Peter O. Knight, president, in his annual statement to the stockholders.

During 1926 an issue of $1,000,000 of series "A" preferred stock was authorized and offered for sale on Aug. 1. At the end of the year $333,100 of this stock had been sold for cash and an additional $93,700 had been subscribed for payments in installments.

In the early part of the year the $100 par value common stock was split five no par for one.

In 1926 the company expended for maintenance, which is included in operating expenses, 12.2 per cent of the entire earnings of the year, and in addition during this period a total of 17.7 per cent of these gross earnings was set aside for reserves or retained as surplus. The amount retained in retirement reserve at the end of the year and invested in plant was $1,037,710.

The earnings and expense statement for the year was cast in new form with explanations of important items. In the statement on railway operation items are shown as follows:

Transportation earnings $1,279,941

23,920,188 passengers paid $1,270,479 for transportation; the balance of $9,462 came from miscellaneous sources such as special concessions, special cars, and rent of equipment.

Operation—Transportation $687,314

Wages, conducting transportation and miscellaneous items due primarily to operating 4,726,719 car and bus miles.

Maintenance—Transportation $332,202

Wages and materials used in keeping cars, buses, track and other transportation equipment and buildings in efficient operating condition. This item also includes $96,651 accrued for depreciation on street cars and buses.

OPERATING STATISTICS OF THE TAMPA ELECTRIC COMPANY

	1926	1925
Number of street cars owned	158	165
Miles of equivalent single track owned	55.87	55.13
Number of buses owned.....	31	22
Miles of bus routes.........	16.2	16.2

The growth in the number of passengers carried since 1916 is noted in the following table. This list excludes transfer passengers:

1916	10,872,102
1917	11,107,645
1918	11,958,831
1919	14,247,180
1920	15,260,820
1921	17,224,084
1922	17,032,058
1923	16,451,400
1924	16,123,569
1925	21,641,839
1926	23,920,188

Partial Discontinuance in California Authorized

Permission has been granted by the California Railroad Commission to the San Jose Railroad to discontinue railway service and to remove its tracks on its Hanchett Park line. The Peninsular Railway, San Jose, Cal., has been authorized by the Railroad Commission to abandon its franchise and to remove its tracks from portions of Saratoga Avenue, Bellamy Street and Franklin Street in the town of Santa Clara. Both companies are controlled by the Southern Pacific Company.

Sacramento Report Issued.—The Sacramento Northern Railway, Sacramento, Cal., reports to the Railroad Commission its 1926 operating revenue at $1,569,482. The operating expenses, excluding taxes for 1926, are reported at $1,181,297, leaving net operating revenue of $388,185. Taxes charged to operation amounted to $81,824. Deducting the taxes leaves operating income of $306,361 for 1926. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $352,104.

Fordson Franchise May Go to City.—Negotiations have been started which, if successful, will result in the city of Detroit, Department of Street Railways, taking over the Detroit United Railway franchise in Fordson, Mich., which will expire on Nov. 9, 1927. The Detroit United Railway property involved includes 2.65 miles of track on Michigan Avenue. It is understood that the Department of Street Railways has submitted an offer to Fordson, with a promise to build a double track through the city, if it is granted and a satisfactory settlement can be made with the Detroit United. The estimated cost to the Department of Street Railways, including payment to the Detroit United, laying double tracks, paving between tracks and other improvements contemplated, is approximately $138,000. In the event the negotiations are successful the present fare of 11 cents from Detroit to Fordson will probably be reduced.

Abandonment Petition Filed.—The New York & Stamford Railway filed a petition on May 3 with the New York Public Service Commission for approval of a declaration of abandonment of portions of its route in Rye and the town of Mamaroneck, Westchester County. Public hearing will be held on this application.

Would Discontinue Line.—The Berkshire Street Railway, North Adams, Mass., has applied to the Vermont Public Service Commission for authority to discontinue railway service between North Bennington, Vt., and the New York State line. The company has also applied to the New York Public Service Commission for permission to abandon its line between the Vermont State line and Hoosick Falls, N. Y. If the petitions are allowed the Hoosick Falls-Bennington line will be closed to railway service except from Bennington to North Bennington in Vermont. The road was constructed in 1898 and of recent years has developed into a non-paying proposition.

New Director of Cities Service.—M. H. Aylesworth was elected a director of the Cities Service Company, New York, N. Y., at the annual meeting of stockholders. Last fall Mr. Aylesworth was made president of the National Broadcasting Company, Inc. Before that he was managing director of the National Electric Light Association.

Service in Peterborough Ceases.—Negotiations between the city of Peterborough, Ont., and the Hydro-Electric Power Commission looking toward the sale of the Peterboro Radial Railway System failed and service has ceased. It is claimed by the Hydro-Electric that the railway is operated at a loss of $50,000 a year. The city offered $150,000 for both railway and gas works. The price set by the Hydro-Electric is $575,000 for the two. It is believed an offer will be made to a private bus company. If the Hydro-Electric fails to operate cars for 90 days the franchise lapses.

Small Road Bought.—Announcement was made on April 12 of the purchase of the Maysville Street Railroad & Transfer Company, Maysville Gas & Electric Company and all other holdings of the Maysville Public Service Company, with the exception of the water plant, by J. P. Mathews, general manager of the Kentucky Power Company, Augusta, Ky., a few miles east of Maysville, Ky. The railway covers 4 miles of line. The Maysville properties had been controlled by the Cochran family of Maysville for 50 years or more. It was reported that the deal, which included the Maysville & Flemingsburg Light & Power Company and Maysville Ice & Cold Storage Company, involved about $2,000,000.

California Company Makes Report.—The Petaluma & Santa Rosa Railroad, operating from Santa Rosa to Petaluma and Sebastopol, reports to the California Railroad Commission its 1926 operating revenue at $611,280, compared with $571,330 for 1925. The operating expenses, excluding taxes, are $454,531 for 1926 and $432,602 for 1925, leaving net operating revenue of $156,749 for 1926 and $138,728 for 1925. During 1926 taxes charged to operation were $34,394 and $26,799 for 1925. Deducting the taxes leaves operating income of $122,355 for 1926 and $111,929 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectable revenue and rents. The gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, is $125,607 for 1926 and $116,024 for 1925.

Traffic Shows Decrease.—The United Railways, St. Louis, Mo., carried 1,314,556 fewer passengers during the first quarter of 1927 than in the similar period of 1926, the figures being 63,371,709 and 64,686,265 respectively.

Legal Notes

FLORIDA.—*Proof of Fraud in Releases Must Be Convincing.*

It is the policy of the law to encourage and favor the compromise and settlement of controversies, when such settlement is entered into fairly and in good faith between competent parties, and is not procured by fraud or overreaching. In order to accomplish the impeachment as for fraud, of a release so executed, proof of the fraud should be clear, cogent, substantial and convincing. [Florida East Coast Ry. vs. Thompson, 111 So., 525.]

KANSAS.—*Conductor Should Protect Passengers from Assault.*

Plaintiff on entering street car stood alongside of a seat which was occupied. As one part of the seat became vacated, she attempted to sit down. Passenger occupying other part of the seat told her she could not sit there. She sat down and passenger struck her, knocking her across the aisle. She got up, went back and sat down again. The man again struck her with his fist. She got up, went to sit down again and the man struck her for the third time. The conductor stood facing her, only 8 ft. away. After being struck the third time the conductor took hold of her and threatened to call a policeman. Nothing was said to the passenger who had struck her. The conductor took the plaintiff away and the passenger who had struck her left the car. The court, in censuring the conduct of the conductor, held that the law required him to exercise diligence to protect passengers from unprovoked assault and battery by fellow passengers, and when another passenger used force to prevent the plaintiff from exercising her privilege to occupy a vacant seat it was the conductor's duty to protect her. [Holmes vs. Fleming, 253 Pac., 224.]

MAINE.—*Truck Driver Must Listen and Look Also.*

A driver of a motor truck colliding with a trolley car must establish not merely negligence of defendant but his own freedom of contributory negligence. While motor trucks and trolley cars have co-extensive rights and reciprocal duties at street crossings, close watch is required on the part of the motorman. Likewise it is the duty of the driver of a truck also to look, and where he did not do so, but only listened, his failure so to look when his truck was proceeding at a slow rate of speed and could have been stopped in a short distance was contributory negligence barring recovery. [Blanchette vs. Waterville, F. & O. Ry., 136 Atl., 116.]

MARYLAND.—*Proximate Cause of Accident Was Intervention of Automobile.*

Plaintiff was waiting for a street car. As it approached him it failed to stop and he was struck by an automobile going in the same direction, which knocked him into the car. It was held that the failure of the motorman to slacken his speed was not negligence and that the intervention of action of the automobile driver, rather than the motorman's failure to stop the car, was the proximate cause of the injury. [United Rys. & Elec. Co. of Baltimore vs. Perkins, 136 Atl., 50.]

MASSACHUSETTS.—*Rules on Interstate and Intrastate Transportation.*

Appellant was the owner of a number of omnibuses engaged in passenger transportation, both interstate and intrastate, the same buses being used on the entire route. The intrastate carriage constitutes a substantial part of its business. Under the state law operation is prohibited where transportation is similar to that afforded by a railway along the route on which the vehicle is operated or as a business between fixed and regular termini, without first obtaining a license from the city or town, and operation under such license is prohibited until the owner has obtained from the department of public utilities a certificate of public convenience and necessity. No license or certificate is necessary if such carriage be entirely interstate. Power to restrain such operation is vested in the Supreme Court and Superior Court jurisdiction in equity, on petition. Appellant has no such license in the cities where its route parallels that of the street railway and such operation has resulted in financial loss to the latter, who has caused appellant's drivers to be arrested and prosecuted and intends to prosecute them for operating without obtaining the licenses and certificates required by statute. Appellant attempts to restrain the enforcement of the statute on the ground that it conflicts with the commerce clause of the U. S. Constitution and the Fourteenth Amendment. The record contained no information as to the number of passengers carried in the same vehicles and what part of the total number was interstate or intrastate, nor that the two classes of business are so commingled that the separation of one from the other is not reasonably practical. It was held that appellant may not evade the act by the mere linking of its intrastate transportation to its interstate or by the transportation of passengers by the same instrumentalities and employees; that there is no support for the contention that the act deprives it of its property without due process of law and that the state has the right and power to regulate the use of its highways so long as it does not directly burden or interfere with interstate commerce; plaintiff has no standing to attack the statute as a violation of the due process clause. [Interstate Buses Corp. vs. Holyoke St. Ry. Co., et al., 47 Superior Court Rep., 298.]

NEW JERSEY.—*Damages for Injuries to Children Held Not Excessive.*

The sum of $15,000 for weak-minded three-year-old boy losing one leg, with injury to the other, and $7,000 to father, held to be not excessive. [Ketterer vs. P. S. Ry. Co., 135 A., 679.]

NEW JERSEY.—*Attempt by Town to Regulate Rate of Fare Declared a Nullity.*

Under an ordinance passed in 1921 a fare of 10 cents was allowed to be charged for the carrying of passengers by omnibuses on Sundays. Under an amendment to the ordinance passed in 1926, an attempt was made to fix all fares at 5 cents. Prior to the amendment and in 1924 the Legislature had passed an act vesting buses under the control of the Board of Public Utility Commissioners, and this control included the fixing and regulation of fares to be charged. The prosecutors, all of whom were in the employ of a company operating buses, had been fined for collecting the 10-cent fare. The court, in setting aside the convictions, held that the act of the legislature divested the town of its power to fix and regulate fares and that its attempt to adopt the amendment was a nullity. [Morrison, et al., vs. Town of West New York, 136 A., 175.]

OHIO—*Time Allowed to Provide Convenient and Necessary Service.*

Where the Public Utility Commission finds that a motor transportation company does not give convenient and necessary service upon a certain route, it should give to the company a reasonable time, not less than 60 days, to provide such service, before it grants permission to a competing motor transportation company to extend and increase its service upon the route in question. [Central Ohio Transit Co. vs. Public Utilities Commission of Ohio, 154 Northeast. Rep., 323. (See also Scioto Valley R. & P. Co. vs. Public Utilities Commission of Ohio, 154 Northeast. Rep., 320.]

RHODE ISLAND.—*Employees Not Guilty of Negligence Because Man Is Struck While Lying Prone on Ground at Night.*

Defendant's trolley, proceeding between 20 and 25 miles an hour, between streets on a rainy night, struck and killed the plaintiff. There was testimony to the effect that the headlights of the car could be seen for a distance of 600 ft. and it was making considerable noise; that as the car was proceeding, the motorman, and another employee who was also in the front part of the car, saw something on the ground close to the track; that at first neither could see what the object was, but within a second or two they saw a man with his back toward the trolley car, prone on the ground on his hands and knees. The car immediately slowed down and the operator did all that he could do to make a quick stop, but before a full stop could be made the man was struck, receiving injuries resulting in his death. The car was 40 ft. long and stopped in less than its length. At the conclusion of the evidence a verdict was directed in favor of the defendant, which was affirmed on appeal on the ground that there was no negligence on the part of the motorman, as the evidence clearly disclosed that he did all that he could have done to avoid the accident as soon as he saw there was any danger. [Caporicci vs. United Elec. Rys., 136 A., 11.]

Personal Items

A. B. Paterson Heads Southwestern Section

Vice-President of the New Orleans Public Service Company in Association Post

A. B. Paterson, newly elected chairman of the railway section of the Southwestern Public Service Association, is of the younger type of utility executives rapidly forging to the front and taking the lead in the readjustment of electric railway operations to meet present-day conditions. As vice-president of the New Orleans Public Service Company, "Pat," as he is best known among his associates and friends, is in direct charge of operations not only of the railway property in the South's "Queen City" but of gas and electric services as well.

A. B. Paterson

The new railway section head is an engineer. His fingers are on the pulse of each department's activities. His ability and knowledge are recognized by all with whom he comes in contact. But there is no engraved diploma over his desk. If he has one he has never let it be discovered. One senses that he is largely "self-made." There is about him something which gives the impression of years of study after working hours, of the determination which wrests technical knowledge out of books and the hard knocks of experience while the world is busy with recreation and sleep.

Mr. Paterson was born just outside of Toronto, in Canada, 43 years ago. He is an adopted rather than a native son of the South, but nearly twenty years of his experience has been gained below the Mason and Dixon line. He first attracted attention in the utility field while doing special field work for Henry L. Doherty & Company. He became vice-president and general manager at Meridian, Miss., but continued to do special field work for Mr. Doherty. Later he joined the forces of Newman & Company, acting as representative on various Southern properties.

It was during this period that "Pat" gave considerable attention to the New Orleans utilities and became intimately acquainted with these properties. In 1920 he was appointed general superintendent and held that position until the death of A. L. Kempster, when he was put in charge of all operations as vice-president and general manager. Under the leadership of H. B. Flowers, president, Mr. Paterson has welded the New Orleans organization into a loyal, enthusiastic team.

"Pat" is not much in the limelight. He shuns publicity and shrinks from a camera. He is a silent worker and is known for his accomplishments rather than his exploits on the platform. But he is intensely human—and he has a hobby. Pat is an inveterate fisherman. During the season when the finny tribe tempt line and net he sometimes omits his Sunday morning conferences with department heads and lays down slide rule and operating report to try his hand with the sportsman's rod.

His election as chairman of the railway section was accompanied by little demonstration, but there was a feeling of confidence as he took the helm—a feeling that the new pilot knows his job; that the affairs of the railway section are in the hands of a capable leader.

L. M. Zapp Succeeds E. J. Burdick

L. M. Zapp has been appointed vice-president and general manager of the Detroit United Railway, Detroit, Mich. He succeeds E. J. Burdick.

Messrs. Sloan, Gadsden and Brosseau C. of C. Directors

Matthew S. Sloan, president of the Brooklyn Edison Company, has been nominated a member of the board of directors of the Chamber of Commerce of the United States. He will be unopposed, so the election is a perfunctory matter. In addition to Mr. Sloan, new directors elected were: William Pfaff, New Orleans; Robert P. Lamont, Chicago, and Edward Peck, Omaha.

In addition thirteen members who have been serving as directors were re-elected for new terms. They are: Stanley H. Bullard, vice-president of the Bullard Machine Tool Works; Philip H. Gadsden, United Gas Improvement Company; William Candler, vice-president Atlanta-Biltmore Company; J. G. Leigh, L. B. Leigh & Company; E. T. Meredith, Meredith Publications; Dwight B. Heard, Dwight B. Heard Investment Company; Everett G. Griggs, president St. Paul & Tacoma Lumber Company; Charles W. Lonsdale, president Simonds-Shields-Lonsdale Grain Corporation; John G. Lonsdale, president National Bank of Commerce; Walter M. Daniel, Havana; H. A. Smith, president National Fire Insurance Company; A. J. Brosseau, president Mack Trucks, Inc., and A. L. Humphrey, president Westinghouse Air Brake Company.

New Supervisor of Accident Prevention in Chicago

William Pasche has been appointed supervisor of accident prevention of the Chicago Surface Lines. He succeeds Victor T. Noonan, resigned. Mr. Pasche has been with the company since 1904. He began as a conductor working out of the Division carhouse. In 1918 he was made supervisor and his work in that capacity attracted so much attention that he was promoted to the position of assistant division superintendent five years later and stationed at North Avenue. In 1925 he succeeded to the position of division superintendent at North Avenue, which is the largest carhouse on the system. He has won frequent commendation from the management by the efficient way in which he has operated the 600 runs and managed the 1,400 trainmen and 414 cars under his supervision. Last year his station won the trophy in the accident prevention contest, which extended over a period of twelve months. The initiative and resourcefulness he exercised in this campaign proved to the management that he was capable of taking charge of all the accident prevention work on the system and when, through the resignation of Mr. Noonan, the opportunity arose Mr. Pasche was immediately selected.

William Pasche

Frank W. Shappert and L. E. Butler Recent Appointees

Frank W. Shappert, formerly general traffic manager of the Chicago, North Shore & Milwaukee and the Chicago, South Shore & South Bend railroads, was appointed recently to the position of assistant to Bernard J. Fallon, vice-president in charge of operation of the two lines. Mr. Shappert is especially charged with the development of plans for increasing traffic.

Another important change in the North Shore organization is the appointment of L. E. Butler as assistant to C. E. Thompson, vice-president. He will be responsible for rates, divisions and tariffs, and relations with individuals and other transit companies.

W. S. Finlay, Jr., Heads West Penn Electric

Former Vice-President of American Water Works Made President of Large Utility—H. L. Mitchell President of West Penn Railways

W. S. Finlay, Jr., for the last seven years a vice-president of the American Water Works & Electric Company, Inc., has been elected president of the West Penn Electric Company and chairman of the board of its major operating subsidiaries, the West Penn Power Company and the West Penn Railways. G. M. Gadsby, for many years identified with the West Penn Electric properties and lately a vice-president of the West Penn Power Company, has been elected president of the latter corporation, while H. L. Mitchell, the present vice-president of the West Penn Railways, has been elected president of that company.

R. B. Keating has been elected vice-president in charge of finances of the West Penn Electric Company and will supervise the finances of all of its operating properties. Mr. Keating has, for the past thirteen years been prominently associated in various financial capacities with the West Penn Electric properties, prior to which time he had had a wide public utility experience.

Mr. Finlay has long been identified with public utility properties. For some years before his association with American Water Works & Electric Company, Inc., he was superintendent of motive power of the Interborough Rapid Transit Company, New York City. He is a member of the American Engineering Council, United Engineering Society and Engineering Foundation, past vice-president of the American Society of Mechanical Engineers and a fellow of the American Institute of Electrical Engineers. Mr. Finlay will move from New York City to Pittsburgh, the central office of the West Penn Electric System. He was graduated from Cornell University in 1904.

G. M. Gadsby, the new president of the West Penn Power Company, was graduated from Marietta College, Marietta, Ohio, in 1906, and from the Massachusetts Institute of Technology in 1909. Immediately thereafter he started work with the properties now controlled by the American Water Works & Electric Company, Inc. In 1918 he became vice-president of the West Penn Power Company and has since served in that capacity. Mr. Gadsby is a past-president of the Pennsylvania Electric Association and as its head was active in stimulating better relations between utilities and the public. He is also a member of the Engineering Society of Western Pennsylvania and the Association of Iron and Steel Electrical Engineers; he is well known throughout the territory served by the West Penn Electric System.

H. L. Mitchell, who has been elected president of the West Penn Railways, has devoted his entire working life to the railway properties of the West Penn Electric system. He received his schooling in Warren, Pa., and entered the employ of the West Penn Railways in 1902. He was elected vice-president of the West Penn Railways in 1920. Mr. Mitchell is vice-president of the Pennsylvania Street Railway Association and an associate member of the American Electric Railway Association.

The executive changes outlined previously are a final step in the co-relation and co-ordination of the subsidiary electric and transportation properties of the West Penn Electric Company. The major companies of the West Penn Electric system are: West Penn Power Company, West Penn Railways, Monongahela West Penn Public Service Company and the Potomac Edison Company.

The population served totals more than 1,600,000 in western Pennsylvania, northern West Virginia, western Maryland and northern Virginia, as well as a small portion of the southeastern section of Ohio.

Father of Interurban Dead

Charles L. Henry, Pioneer Operator, Active Until Almost the Last—Man of Charming Mien Who Won for Himself the Appellation of "Engineer of Good Will"

THE passing of a man like Charles L. Henry, who died at his home in Indianapolis, Ind., on May 2, invests with reality Carlyle's complaint that more good lives are lived than written.

Charles L. Henry

Mr. Henry was making history in this industry when most of those of the present generation were in swaddling clothes, and he continued to make history almost until his dying day. This he did unobtrusively, never seeking the limelight. He worked effectively and fearlessly, but always fairly. Unchanged by his successes, Mr. Henry was equally unchanged by his defeats. And he tasted bitter defeat. Twice was his fortune swept away. That made no difference in the outward demeanor of the man. These observations are merely specimen bricks that show the hardihood of the man who was the father of the interurban railway and held at one time the most important office within the power of the industry to bestow, that of president of the American Electric Railway Association.

To this office, filled by him in 1915-1916, Mr. Henry brought a great store of experience, for he had a record of success in the practice of law, had owned the Indianapolis *Journal*, served usefully as a member of the Indiana State Senate and as a member of Congress and was nationally recognized as one of the notable pioneers of interurban electric railway development. It was he who gave the word "interurban" to the language. For more than 35 years he was foremost among the keen-visioned in community building by amplifying rapid transit facilities. He was a pioneer not only in the building of railways, but in the application and use of new methods. The road of which he was long president, the Indianapolis & Cincinnati Traction Company, was one of the earliest successful single-phase systems in the country. His service at Washington in the interests of the electric railway industry during the war-time period was notable. General George H. Harries said of him at Chicago in 1922 at the past-president's day at the meeting of the association that Mr. Henry had kept the industry straight federally and tried to keep the federal authorities straight—with gratifying success. On that memorable occasion General Harries concluded his remarks about Mr. Henry with these words: "His personal charm and our gratitude bind us to him, and always will."

For 37 years Charles L. Henry was a factor in the railway world. He was graduated from the law school of the Indiana University in 1872. He was then 23 years of age and he practiced in Pendleton, Ind., and Anderson, Ind., until he began his connection with the railway industry, nineteen years later. He entered the industry by purchasing the local line at Anderson and made it the nucleus of the far-flung system of the Indiana Union Traction Company. That was a long time ago. Only to the so-called old-timers does the recital of these facts stimulate memories of that now imaginary aroma of the stables and barns that were really barns, and of reeking harness which was as frankincense and myrrh precious to the nostrils of the railway presidents of the distant days in which pine tables served for presidential desks and drivers were paid $1 for a fourteen-hour day; in which the books of accounts were kept by bright lads who labored after school hours for $2 a week and deemed themselves to be well on the way to great riches. It is fascinating to reminisce, particularly fascinating in the case of a man like Mr. Henry, but his life was replete with so many activities that the story of the man would quickly get out of bounds if the attempt were made to elaborate the facts. This is unfortunate, but it is true. The history of a man active in affairs for more than 35 years cannot be covered even cursorily within the limitations which are laid down by the laws of journalism.

Mr. Henry coined and applied the name interurban to the new lines in Indiana. As indicated before, his venture at Anderson was the beginning of the now famous Union Traction Company, formed in 1899 to combine electric railways that had sprung into existence following the success of Mr. Henry's pioneer line from Anderson to Alexandria. Subsequently, as general manager of the company, Mr. Henry constructed the line from Muncie to Indianapolis, forming the backbone of the system as it exists at the present time. Later he disposed of his interest in the company to form the Indianapolis & Cincinnati Traction Company.

All of his activities during his long and successful career centered in or about Indiana, his native state, but his every instinct was that of the pioneer who avoided the beaten trail. It may appear strange to say so, but it does seem that the best characterization of his personality was that contained in a testimonial presented to him about ten years ago by a committee of engineers. It said: "Charles Louis Henry, loved by us all for his unfailing delightful personality, consummate tact, nice discernments and ready power of appreciating and doing that which is required, is hereby elected to the degree of engineer of good will." That was the encomium bestowed upon a man educated in the law, who had become a financier and had acquired an uncanny grasp of the essentials of engineering, in which he had become a pioneer through the backing which he gave to the men with whom he was associated.

In somewhat similar vein is the memorial on the death of Mr. Henry, adopted at a meeting of electric railway men convened during the session of the Chamber of Commerce of the United States at Washington May 3, 1927, attended by President Storrs. That memorial said:

> With profound sorrow and deep regret, representatives of the electric railway industry, assembled at Washington, learn of the death of Charles L. Henry. A pioneer of electric railways, a past-president of the American Electric Railway Association, for years the chairman of the association's committee on national relations and its able counsel. Mr. Henry had been a powerful factor in the development of the industry. He brought to his work a wide experience gained as a lawyer, a member of Congress, a newspaper publisher and a citizen.
>
> A man of intense loyalty, of unusual intelligence, of cool judgment and of understanding, he laid the industry under a deep debt of gratitude for services performed. His genial, lovable nature, his innate kindness and his genius for friendship endeared him to his host of friends.
>
> By this memorial, we record our sense of the loss that we have sustained in the death of one who has been a friend and mentor to us as individuals and a tower of strength to the industry which we represent.

No amount of vigorous phrasing would add materially to this record. Suffice it to say, in conclusion, that the quiet power and the unrevealed glory of this man, to whom the law was not anything that's boldly asserted and ingeniously maintained, are not within the comprehension of fatuous Philistines of the present day.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Substation Equipment Ordered by Milwaukee Railway

A contract for substation equipment has just been closed by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., with the Westinghouse Electric & Manufacturing Company. This contract calls for two 1,500-kw. and two 500-kw., 60-cycle railway converters, transformers and automatic switching. The equipment will be used to supply 600-volt direct current to the street railway system, which is to be changed over from the present 1,200-volt operation.

This last move completes the change-over of the entire system to 600-volt operation. The equipment included in this order is to be used on what is known as the East Troy and Burlington branches of the system. Due to the length of these branches, it was necessary to build five new substations in order that sufficient power could be supplied at the reduced voltage. The equipment included in the above order will be used in these stations, together with some that was in possession of the customer at the time the change-over was made.

The automatic switching supplied on this order includes equipment for the full automatic control (undervoltage starting and light load stopping) of the five new 500-kw. substations on the East Troy and Burlington branches.

The two 1,500-kw. railway converters included in this order are to be installed at the Thirty-sixth Street station and the Oakland Avenue station, each one of which will be full automatic controlled. In addition these two stations are to be equipped with Westinghouse audible type supervisory control equipment. Control and supervision of seven feeder circuit breakers, two lockout relays and two signal circuits at the Thirty-sixth Street station and six circuit breakers, two lockout relays and two signal circuits at the Oakland Avenue substation will be accomplished with this equipment.

On completion of this installation the Milwaukee Electric Railway & Light Company will have seven substations under full automatic control using Westinghouse switching throughout.

In this connection it is interesting to note that the Lisbon Avenue substation of the Milwaukee company recently placed in operation an automatic, non-attended, alternating-current substation controlling two incoming lines, two transformer banks and five three-phase feeders, operating as fifteen single-phase feeders. All switching of lines, transformers and feeders is completely automatic and functions according to operating requirements. The switching equipment, standard relays on which the automatic features depend, and the reclosing relays for controlling each of the feeders were furnished by the Westinghouse company.

The Grandville substation of this company, which steps down line voltage from 132 kv. to 26 kv., has been recently changed over to a non-attended substation with Westinghouse synchronous visual supervisory control equipment. The switching equipment for this station is also of Westinghouse manufacture.

Exhibits Are Silent Salesmen

Remember to have one on at
Cleveland, when the

A.E.R.A. Meets in October

Reserve Your Space
Between May 16 and June 15

$500,000 for Gas-Electric Cars for St. Paul

Expenditures of more than $425,000 by receivers for the Chicago, Milwaukee & St. Paul Railroad for the most modern type of gas-electric cars were approved April 16 by Judge James H. Wilkerson of the federal district court of Chicago. Orders for the new equipment have not yet been placed, but it is understood it will be used to replace steam service on branch lines in the Western states.

Work Commenced on New Repair Shop for Cincinnati Company

Work on a new repair shop for the Cincinnati Street Railway began April 25. The new shop, estimated to cost more than $500,000, will have a floor area of 147,920 sq.ft., with a separate building for housing the stores department of 23,250 sq.ft. It will be located on property already owned by this company on Mitchell Avenue and the Baltimore & Ohio Railroad, the site being easily accessible from all sections of the system. Preliminary plans were prepared by E. J. Jonas, superintendent of equipment, and architectural details were completed by Col. Harry Hake. The contracts were placed with the Fisher-DeVore Construction company of Cincinnati. Brick and steel will be used for construction, while the roof will be the flat monitor type. The shop is to have a capacity for handling work on 60 cars at one time, which is 10 per cent of the cars in regular operation. It will also be possible to paint all cars as frequently as necessary as a spraying system will be used.

All departments and facilities for making major repairs to rolling stock and for overhauling and painting this equipment will be installed in this shop. The stores building will receive and disburse supplies and material for all departments of the company.

Although the company does not plan to build cars, it will be in a position to handle its own heavy repairs and reconstruction. One department of the shop will be fitted to take care of body repairs for the motor coach division.

Since the Cincinnati Street Railway Company resumed the operation of its property Nov. 1, 1925, it has been using a section of the Cincinnati Car Company shops for major repair work.

A. K. Brumbaugh Joins White

A. K. Brumbaugh, formerly in charge of the experimental and test engineering departments of the Autocar Company, has joined the commercial engineering department of the White Motor Company. He is associated with G. W. Smith, Jr., technical assistant to Thomas H. White, vice-president and general manager, and will have charge of the division whose function is the establishment and maintenance of White standards. Previous to twelve years service with the Autocar Company, Mr. Brumbaugh was superintendent of transportation for the Consolidated Gas & Electric Company of Baltimore, engineer for the Maryland Casualty Company, with the railway engineering division of the Westinghouse company and the electrical department of the Baltimore & Ohio Railroad. He was graduated from Lehigh University in 1909 as an electrical engineer.

Sales of Mack Buses to Public Utilities High

Sales of Mack buses to electric railways and steam railroads during the first quarter of 1927 were higher than for any like period since buses became an important factor in transportation. During the first quarter this year, 82 per cent of bus sales were to public utility companies. Thirty-two per cent of buses sold were gas-electric drive and 30 per cent were the new Mack six-cylinder type. Bus sales in March to utility companies amounted to 73 per cent of the month's total business. Among the sales reported were the following:

Oklahoma Union Railway, Tulsa, Okla., six 25-passenger city type buses, four-cylinder;

Lehigh Traction Company, Bloomsburg, Pa., one 25-passenger city type bus, four-cylinder;

New York, Westchester & Boston Railway, New York, 25 29-passenger city type Macks, four-cylinder;

East St. Louis & Suburban Railway, East St. Louis, Ill., one 29-passenger city type, four-cylinder;

New York, New Haven & Hartford Railroad, Boston, Mass., twelve 230-in. wheelbase Mack bus chassis, four-cylinder;

Twin City Rapid Transit Company, St. Paul, Minn., seven 230-in. wheelbase Mack bus chassis, four-cylinder;

Iowa Southern Utilities Company, Des Moines, Iowa, four 25-passenger city type buses, four-cylinder.

Report of a sale of twelve city type Macks, ten 25-passenger and two 29-passenger, to the United Railways & Electric Company, Baltimore, Md., in January was also received in March.

Officials of the International Motor Company's bus department in close contact with the situation in the electric railway field are optimistic concerning the outlook for the balance of the year.

New Cars for Henry Ford's Road

The gasoline-electric cars recently placed in service by the Detroit, Toledo & Ironton Railroad were built by the Pullman Company, which co-operated with the Hall-Scott Motor Company and Westinghouse Electric & Manufacturing Company. The cars are of all steel aluminum construction, 72 ft. 6 in. over all, 14 ft. high and 10 ft. 4 in. wide. Each car weighs approximately 66 tons.

Henry Ford is using gas-electric cars on his D., T. & I. line

R. L. McLellan in New Westinghouse Post

Ross L. McLellan, formerly managing director of the Compañia Westinghouse Electric Internacional, S. A., has been appointed general manager of the Westinghouse International Company with headquarters in New York. He was graduated from Purdue University with a degree in electrical engineering in 1907 and joined the Westinghouse forces in 1915 in Chicago as a salesman in the railway field. In 1920 Mr. McLellan became a member of the staff of F. H. Shepard, director of heavy traction, and in 1921 went to Santiago, Chile, where he contracted on behalf of the Westinghouse company for the electrification of the Chilean State Railways. In 1922 he represented the company in important negotiations with the government-owned railways of Brazil, and in 1923 was sent to Europe, also in connection with railway electrification. In 1924 he was made managing director of the Compañia Westinghouse Electric Internacional, S. A. Mr. McLellan is president of the Chamber of Commerce of the United States in Argentina and a member of the A.I.E.E.

Copper Dips Below 13 Cents—Lead Prices Cut

Dullness continues to be the outstanding characteristic of the non-ferrous metals in the domestic market. In spite of this prices have remained comparatively firm. This applies to each of the metals except lead, in which business has been done in moderate volume, apparently stimulated by lower prices. In general buyers are confident that their current needs can be met without difficulty and that there is no occasion for buying ahead. Though the principal copper producers have held firmly at 13 cents, some sales have been made at concessions all week, and the market cannot be quoted at the even 13 cents delivery in the East. On May 4 lead in New York was obtainable at a slight concession under the Smelting company's price of 6.75 cents, the prevailing quotation in the St. Louis market being 6.40 cents. Zinc has been fairly steady at 6.125 cents, or a trifle under, all week. Tin has been quiet, with prices fluctuating within narrow limits.

With one or two exceptions the past week has seen the dullest copper market in two or three years. Producers generally are in a fairly comfortable position, and they are apparently confident that the April statistics will show a marked reduction both in mine production and in stocks of refined metal.

Except for a few sales of moderate tonnage by first-hands and one or two by second-hands, the business of the week was placed at 13 cents in Connecticut and 13.125 cents at Middle West points. The bargain prices are reflected

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	May 3, 1927
Copper, electrolytic, cents per lb.	12.750
Copper wire, cents per lb.	15.125
Lead, cents per lb.	6.73
Zinc, cents per lb.	6.46
Tin, Straits, cents per lb.	66 875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	2.25
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings, Kansas City, net tons	2.50

† Quotations withdrawn because of strike.

Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–20
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.63

in the quotations only because of the extremely light sales by the producers who maintained the 13-cent price. Foreign business has been fair, the export price being 13.35 cents, c.i.f. all week. Some f.a.s. orders were placed at 13.05 cents and 13.10 cents.

On April 28 the American Smelting & Refining Company reduced its New York contract price from 7 to 6.85 cents, and on Monday, May 2, a further reduction to 6.75 cents was announced. The London market has shown a little more strength than in the past, spot lead in that market declining only 2s. 6d. following each decline in New York.

Corroding grades of lead command the usual premium of $2 to $3 per ton.

Statistics of production and consumption for April are not expected to bull the market.

Prime Western zinc has been sold in limited quantities during the week at prices ranging from 6.10 cents to 6.15 cents, East St. Louis. Zinc ore in the Joplin market has declined to $40 per ton, at which price current sales are around 12,000 tons per week against a production only slightly under 15,000 tons. The Far Western zinc districts are contributing increasing amounts to domestic production, so that Joplin does not dominate the situation as decisively as it once did. High-grade is quiet, with 8 cents asked for delivered metal in the New York district.

TIN HOLDS FAIRLY WELL

There has been a moderate business on some days in tin for early delivery. Demand for futures has not amounted to much, though the more distant deliveries have been obtainable for from 1¾ to 2¾ cents less than prompt.

Nugey Process Sold to Swan & Finch

The soapless lubricating grease process developed by A. L. Nugey has been taken over exclusively by the Swan & Finch Oil Company, New York City, with plants at Elizabeth, N. J.; Buffalo, N. Y., and Chicago, Ill. In addition to these plants, branches are located in Syracuse, Boston, Pittsburgh and Detroit. Mr. Nugey is a mechanical and petroleum engineer, well known as the author of the volume "Oil Refinery Specifications."

New Bailey Meter Company Formed

Babcock & Wilcox Company and General Electric Company announce the formation on April 1 of a new company to be known as the Bailey Meter Company, which acquired the flow meter business of the General Electric Company and the fluid meter and combustion control business of the old Bailey Meter Company. Payment for the flow meter business and patent will be made to the General Electric Company in stock of the new company, of which the other principal holder will be the Babcock & Wilcox Company.

E. G. Bailey, president of the present Bailey Meter Company, will be president of the new company. R. S. Coffin, vice-president of the present company, will be vice-president in charge of administration and finances. R. E. Wooley, now connected with the General Electric Company, will be vice-president in charge of engineering and sales.

Messrs. Morrow and Cutter Added to International G.E. Board

Dwight W. Morrow, of J. P. Morgan & Company, and Victor M. Cutter, president of the United Fruit Company, were elected directors of the International General Electric Company on April 29.

Gerard Swope, president of the General Electric Company, was elected chairman of the board, succeeding the late Anson W. Burchard; Clark H. Minor was re-elected president; Walter J. Edmonds, comptroller, was elected a new vice-president in charge of financial relations, and E. F. Colyer was named comptroller.

Track and Line

Milwaukee Northern Railway, Cedarburg, Wis., has announced that it will separate its tracks from grade for 13,800 ft. between Fiebrantz Avenue and the Silver Spring Road crossing in Milwaukee. The tracks will be depressed under Olive Street, the proposed Roosevelt Drive, Silver Spring Road and the extension of 27th Street and are to be elevated over Hampton Road and across the lowlands adjacent to Mud Creek. According to R. H. Pinkley, vice-president, the work is being done to avoid the congestion of surface operation and the hazard on busy crossings in this rapidly growing residence section. The work will cost $270,000.

Municipal Street Railway, Seattle, Wash., is meeting with opposition in its proposed plan to tear up the single track on Fourteenth Avenue Northwest and to double track the line on Fifteenth Avenue Northwest from Fifteenth Avenue bridge to 67th Street and construct a single track from that point to the city limits. The chief opponents of the change are merchants on Fourteenth Avenue Northwest. Property owners in the district involved have been invited to bring their street railway problems to the City Council at an early date. The proposed work will cost $42,000.

Shops and Buildings

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is remodeling one of its oldest carhouses at National and 22d Avenues, at a cost of about $50,000. A new front and a new roof, pits and tracks will be installed. In addition new tracks will be laid on National Avenue between 22d and 24th Avenues.

Worcester Consolidated Street Railway, Worcester, Mass., has awarded a contract to the Henry R. Kent Company, Rutherford, N. J., for the construction of a one-story brick and concrete carhouse on Grove Street, Worcester.

Trade Notes

Consolidated Car-Heating Company, Albany, N. Y., has announced that its electric car heaters have been installed on some of the buses in New York City. They are plugged into the city lighting circuit at stop-over points to keep the interior warm, when the motor, which supplies heat from the exhaust on runs, is idle. Another innovation is the use of immersion-type heating units in the water jackets and crankcases of the engines, to keep the water and oil heated when the motor is not running, thereby facilitating starting. These units are also furnished with current from the city circuit.

Lincoln Electric Company, Cleveland, Ohio, announces the appointment of Royal D. Malm as western district sales manager, with headquarters at Chicago. Mr. Malm is an engineering graduate from Case School of Applied Science, Cleveland, Ohio, class of 1912. For four years after leaving school he was engaged in construction engineering and then became identified with the Elyria Iron & Steel Company. Later he went with the Standard Welding Division of the Standard Parts Corporation as general superintendent. For the past year he has had charge of Lincoln sales in the automotive industries with office in Detroit.

International Register Company, Chicago, Ill., has received an order for electrically operated double registers to equip all of the cars of the Shreveport Railways, Shreveport, La.

Prest-O-Lite Company, New York City, announces the sale of the storage battery branch of its business to a new company, Prest-O-Lite Storage Battery Corporation. The entire capital stock of the purchasing company is owned by the Automotive Battery Corporation of New York. That portion of the Indianapolis plant of the Prest-O-Lite Company, Inc., used for the manufacture of storage batteries has been leased to the new company. The Prest-O-Lite Company, Inc., will continue the manufacture and sale of acetylene gas for use in the oxyacetylene process of welding and cutting metals. The company will continue operation of that portion of its Indianapolis plant devoted to the manufacture of gas cylinders, acetylene generators and other apparatus.

New Advertising Literature

Fitzjohn Manufacturing Company, Muskegon, Mich., is issuing a new catalog descriptive of its motor coach bodies especially designed for Studebaker dealers.

Interflash Signal Corporation, New York City, is distributing to state, county, and municipal officials throughout the nation a handsome circular describing its signals. Colored diagrammatic sketches with explanatory text matter present the various traffic situations where the signals are useful.

Alpha Electric Company, Inc., New York City, has just distributed a new folder presenting the uses of its "Van Dorn" electric drills.

Two articulated cars of the W., B. & A., having a four-car capacity, may be operated as a unit

—and on Articulated Cars in high-speed interurban service— "PEACOCK" BRAKES !

REG. U. S. PAT. OFF.

That *"Peacock" Brakes* are adaptable to all types of service is further evidenced by the new high-speed interurban articulated cars built by the J. G. Brill Co. for the Washington, Baltimore & Annapolis Electric Railroad and just placed in service on its Baltimore-Washington Division.

Being of a de luxe type, with better appointments than those of many steam railroads, these articulated cars are the first of this design to be operated in this country in high-speed interurban service. They are an open challenge to all forms of competitive transportation.

We will be glad to furnish you with data and information as to the reasons which prompted this company and the buyers of nearly all modern equipment to specify *"Peacock"* Brakes.

National Brake Company, Inc.

890 Ellicott Square, Buffalo, N. Y.

Canadian Representative:
Lyman Tube & Supply Co., Ltd., Montreal, Can.

Better Headway at Lower Costs

Graham Brothers 21-Passenger Motor Coaches make possible the frequent service that attracts patronage—that fosters the coach riding habit.

They ride—and ride again. When they feel confident of a safe, comfortable ride in a good-looking motor coach, ready when they are, your casual patrons become steady passengers.

Graham Brothers Motor Coaches are attractive. They are safe, comfortable, fast and dependable. Being of medium capacity they carry no excess weight of body or chassis.

They are ruggedly built. They stand up—mile after mile, year after year. Operating and maintenance costs are low. Service is available always and everywhere—no waiting for repair parts, no delays.

GRAHAM BROTHERS
EVANSVILLE—DETROIT—STOCKTON
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONT.

Standard 21-Passenger Street Car Type, complete, $3815
12-Passenger Parlor Coach, complete, $3750
16-Passenger Parlor Coach, complete, $3995
Prices f. o. b. Detroit

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

Super dimensions—special rubber compound. Extra tough, heavy duty, anti-skid tread. Long-wearing, "non-rippling." Sidewalls, same stock as tread and heavily re-enforced. A pneumatic tire especially designed by the maker of the first cord tire in America—for bus, truck and heavy duty service.

More fares carried on your bus line!

In two ways—you carry more fares on Goodrich Heavy Duty Silvertowns.

First—you carry more, because Silvertowns average more trips per set of tires.

Next—you carry more, because Silvertown dependability builds good-will. Your buses run on schedule. They have the utmost freedom from forced stops for roadside tire changes.

They build a reputation for promptness—and that brings more fares to your line.

THE B. F. GOODRICH RUBBER COMPANY, *Established 1870*, Akron, Ohio
In Canada: Canadian Goodrich Company, Kitchener, Ontario

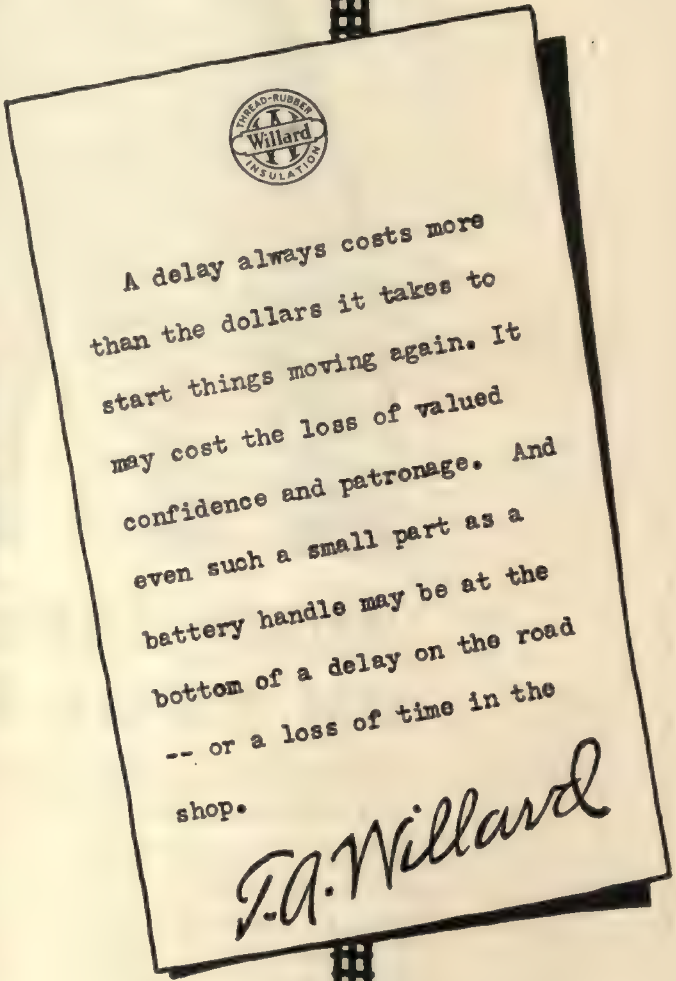
Goodrich

HEAVY DUTY

Silvertowns

HIGH PRESSURE OR BALLOON

Delays Cost Dollars



THREAD-RUBBER
Willard
INSULATION

A delay always costs more than the dollars it takes to start things moving again. It may cost the loss of valued confidence and patronage. And even such a small part as a battery handle may be at the bottom of a delay on the road -- or a loss of time in the shop.

T. A. Willard

Handles, for example, are lead-anchored in the ends of the Willard Bus Battery case. And they are thoroughly coated with acid-resisting lacquer. Willard Battery handles are put on to *stay*—and you don't find them pulling out.

WILLARD STORAGE BATTERY COMPANY
CLEVELAND, OHIO

Willard Batteries

INNUMERABLE children in Southern California ride to and from school in International 6-cylinder coaches.

INTERNATIONAL HARVESTER *Six-Cylinder* COACHES

At the left: *Glimpses of an International Model 15 Club Coach interior. Clear vision at every angle, perfect comfort for every rider, attractive draperies and appointments, every provision for good lighting, heating, and ventilating, and for safety.*

MODEL 15 International Coaches have been developed and perfected to fit the biggest popular demand in motor coach transportation. They serve perfectly the operator who wants medium capacity (15-17 passengers) and medium investment, but who also needs top quality—the top quality in engineering and assembly that means economical operation—the top quality in body and appointment that keeps and adds to patronage and so makes profit for his route.

Model 15	
Club Coach	15-passenger
Sedan Coach	17-passenger
Street car type	15 passenger

Model 15 International Coaches are demonstrating their exceptional values on the well-beaten highways and in far corners of the country, pointing again to the automotive service for which International Harvester is noted. We now have 136 Company-owned branches in the United States for the prompt servicing of International trucks and coaches. Do you know of an organization to equal it? International Harvester will help you give your riders efficient, dependable, luxurious transportation—at the lowest cost.

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. OF AMERICA (Incorporated) Chicago, Illinois

The Mark of Quality

Built for Extra Mileage
In Bus Service

Steep grades; slippery roads; quick stops and starts—Firestone Gum-Dipped Tires assure greater safety, comfort and economy.

Gum-Dipping—saturates and impregnates every fiber of every cord with rubber—builds extra strength and endurance, while the scientifically designed tread grips the road—and provides positive traction in bad going.

Your Firestone dealer will serve you better and save you money. See him.

MOST MILES PER DOLLAR

Firestone

GUM-DIPPED TIRES

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER Harvey S. Firestone

So smooth in action!

Steering gear design must first provide for strength—strength means safety.

Long life of parts—ability to maneuver easily on congested highways—turning short in crowded streets—are secondary essentials but important.

Mack gives them all—plus!

Mack's steering worm and worm gear are large—extra large. They afford great bearing tooth areas. Gears to fit close and accomplish easy action without lost motion must be accurately cut, hardened and finished by hand lapping and polishing—the way Mack makes them.

Lost motion is easily taken up. On both sides of the worm, the ball thrust bearing has a single screw adjustment.

Mack steering parts need never be replaced. Thrust washers on both sides of the worm gear are renewable and permit easy adjustment. Each quarter segment of worm gear may be used successively as wear occurs—in Mack design.

So strong—so safe—so durable!

In Cincinnati—over routes of steep grades and rough pavements—the Cincinnati Street Railway Company uses Macks to help serve the public

"It Doesn't Give Us Any More Trouble Than a Trolley"

Such was the description given by the Master Mechanic of one of the largest traction operations in the United States in describing the operation of his Mack buses. He has had experience with Macks and other vehicles as well. He was judging their performance by his experience with a well maintained traction system.

Mack's ability in his service to give 60 thousand miles without a failure, influenced him to say:—

"If all our buses were Macks, we would never have a bus problem."

In operations with congested traffic experienced operators, such as the Cincinnati Street Railway Company, will tell you Mack steering gears help speed schedules and their freedom from trouble keep the buses on the routes.

They endorse Mack.

Mack Trucks, Inc.
International Motor Company
25 Broadway, New York City

A Living Monument To Character

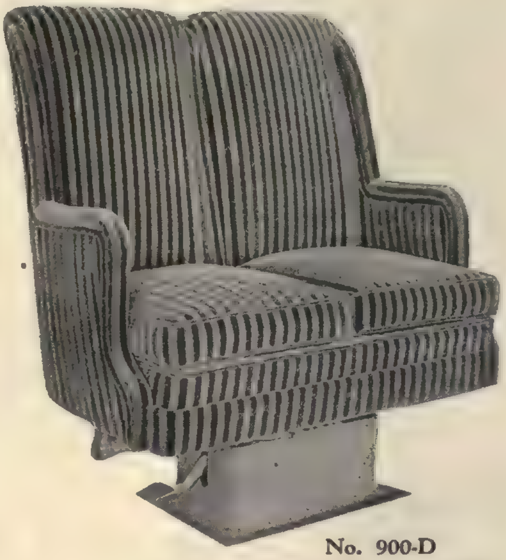
It is not unusual for a truck or motor coach equipped with the Leece-Neville Patented Voltage Regulator to run 125,000 miles without removing the battery for recharging or repair.

Such service stands as a living monument to the character of Leece-Neville electrical equipment.

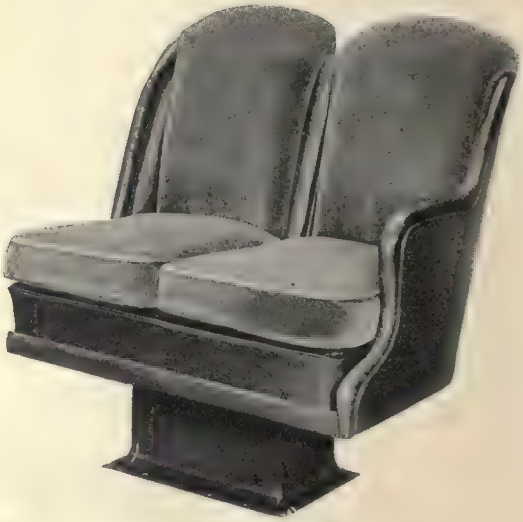
Most manufacturers of the better motor coaches have adopted the Leece-Neville Patented Voltage Regulator as standard equipment. Use them on your coaches and see how much longer your batteries last.

The Leece-Neville Company

5353 Hamilton Ave., Cleveland, Ohio



No. 900-D
Double Rotating Chair



No. 900-D
Double Stationary Chair

Two recent installations

Two typical examples of how Hale-Kilburn Seats fit into modern electric railway programs—

The Washington, Baltimore and Annapolis Railroad's **new articulated cars** are equipped with H-K No. 900-D rotating double chairs with curved back, heavily padded, individual spring cushion seat pads, and individual arm rests at each side, and pedestal device for rotating to opposite position. They are plush covered, luxurious and comfortable.

The remodeling program of the Northern Ohio Traction Co. also called for H-K Seats. These were the No. 900-D double chairs with deep individual seat cushions, divided back and permanent base for one-end cars. These comfortable practical seats are upholstered in a combination of plush and leather.

Whether yours is a new car program or a remodeling program, get full particulars of H-K Seats for every type of service.

HALE-KILBURN COMPANY
General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco
Chris Eccles, 320 S. San Pedro St., Los Angeles

T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS

Baker
Raulang
TRADE MARK REG. U.S. PAT. OFF.
BUS
BODIES

RIDING comfort, added seating capacity, long life, low upkeep cost, are a few of the many *provable* advantages of Baker-Raulang Bus Bodies—the result of 73 years of body-building experience.

A full line is offered, varying from 17 to 29-passenger capacity, designed for city, surburban and parlor car service.

Descriptive bulletins gladly sent on request.

THE BAKER-RAULANG COMPANY
Bus Body Division CLEVELAND, OHIO

What will American learn

McGraw-Hill recognizes to interpret

World competition is becoming increasingly important and perplexing to American Industry—in domestic as well as foreign markets.

Next to our own, the industrial developments in Italy and Germany are the most important in the world today.

In Italy a new theory of industrial control is being tried.

In Germany, American methods of mass production and standardization are being rapidly extended.

What does the Geneva Economic Conference promise in the way of helpful guidance regarding Europe's industrial plans?

The International Economic Conference at a Glance

Fostered by the League of Nations for expert, unbiased discussion among member and non-member nations, without committing the governments represented.

Objectives: To analyze and determine the economic causes of the present disturbed equilibrium in commerce and industry, and to discuss measures for the revival of general prosperity.

Principal subjects for discussion:

Productive capacity of industries of different countries.
International industrial agreements.
Barriers to free flow of international commerce.
Value of exchange of statistics of production.
Industrial management.
Standardization.
Technical and industrial progress and research.
Recruitment of technical staffs.

The importance attached to the Conference by the governments is indicated by the standing of their delegates:

Appointed by President Coolidge: Henry M. Robinson, member of Dawes Commission; Norman H. Davis, member of Armistice Commission and Peace Conference and former Assistant Secretary of the Treasury; Dr. Alonzo E. Taylor, scientist and member of War Trade Board; John W. O'Leary, President, U. S. Chamber of Commerce; Dr. Julius Klein, Director of the Bureau of Foreign and Domestic Commerce; together with a technical staff of nine experts.

International Chamber of Commerce Appointments: Roland V. Boyden, American unofficial observer on Reparations Commission; Etienne Clementel, former French Minister of Finance; Walter Runciman, former President, Board of Trade of Great Britain; Dr, Karl Kotzenberg, member of Reich Economic Council, Germany; Gino Olivetti, Secretary General of the Confederation of Italian Industry.

Foreign Governmental Delegates (partial list): Great Britain, Sir Arthur Balfour (steel), Walter Thomas Layton (editor of *Economist*); Germany, Dr. Carl F. von Siemens (electrical), Wilhelm Eggert (trade union secretary); France, Daniel Serruys (trade agreements and tariffs); Belgium, J. Trasenster (steel); Italy, Angelo di Nola (Director General of Commerce), Alberta Pirelli (manufacturer).

McGRAW-HILL PUBLISHING COMPANY, INC

Industry *from* Geneva?

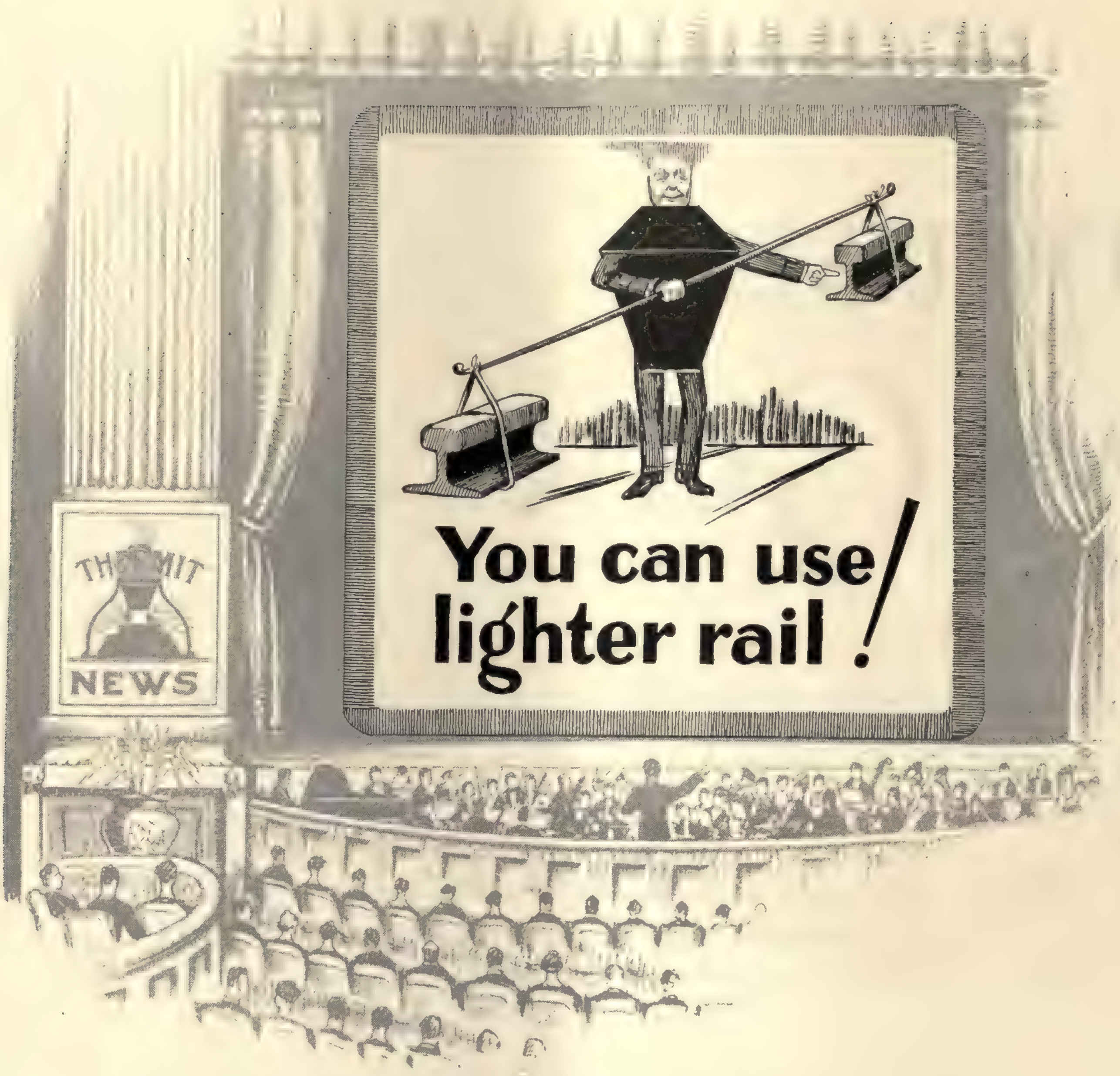
a broad publishing privilege and responsibility
the conference to industry

McGraw-Hill senses the significance of this conference and has taken steps to guarantee something more than a political interpretation of the Conference to industrialists and business executives at home.

Conference events will be brought to industry in its own language through the 15 McGraw-Hill Publications, which will be represented by Mr. E. J. Mehren, Vice-President and Chairman of the McGraw-Hill Editorial Board. After the adjournment of the Geneva sessions, Mr. Mehren will make first-hand investigations in Italy and Germany and report their industrial plans and progress.

This particular service to Industry, while opportune in character, typifies the broad publishing thinking and initiative expected of McGraw-Hill Publications. It is another example of the service that maintains the intense "reader interest" of these publications.

TENTH AVENUE AT 36TH STREET, NEW YORK


THERMIT
NEWS
You can use lighter rail!

One of the major advantages of Thermit Welding on the lines of the Coffin Prize winning Penn-Ohio Electric Company is that it permits smoother, quieter operation with the use of 103-lb. rail for new trackwork in place of the 134-lb. rail formerly used.

Joints, formerly the weak spot in light rail construction, are entirely eliminated by Thermit, and become as strong as the rail itself. There is no gap. Grinding levels off the surface once and for all.

Thermit welding has been made easier and more simple than ever. It costs no more but gives a more perfect result.

Many other electric railways confirm the findings of this Coffin Medal winner.

METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.
PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

Comfort is a Builder of Business

The Truck is a Factor in Riding Comfort

The Public has been encouraged to expect superior service from the electric railway, and, in turn, is quick to respond with increased patronage. Among the features of the modern car, comfort ranks high in attraction value. And especially, comfort in motion. This is controlled largely by the riding character of the trucks. Cummings No. 62 Truck for city and interurban service is skillfully designed, balanced, and exceptionally smooth riding.

CUMMINGS CAR AND COACH COMPANY
Successors to McGuire-Cummings Mfg. Co.
111 W. Monroe St., Chicago, Ill.

Standing through the ages!

Gibraltar—Impervious to the combat of nations and elements alike! Standing grimly at the entrance to the Mediterranean, guarding the interests of a nation, it has withstood centuries of siege—the siege of storm and wind. So it has stood since before the recollection of man. A few thousand years more or less will find it unchanged.

So with Boyerized parts. Their traditional enemies—"wear and tear" and the elements of deterioration—friction and rust—cannot penetrate the granite-like smoothness offered by the Boyerizing process.

The name Boyerize is the fortress of car parts protection and each of the parts listed below is a rampart for the protection of your rolling stock.

Choose your line of defense!

Brake Pins
Brake Hangers
Brake Levers
Pedestal Gibs
Brake Fulcrum
Center Bearings
Side Bearings
Spring Post Bushings
Spring Posts
Bolster and Transom Chafing Plates
Bronze Bearings
McArthur Turnbuckles
Manganese Brake Heads
Manganese Truck Parts
Bushings

STAG BRAND

MANGANESE
BRAKE PINS

They're Boyerized
Too!

Bemis Car Truck Company
Electric Railway Supplies
Springfield, Mass.

Representatives:
Economy Electric Devices Co., 72 W. Van Buren St., Chicago, Ill.
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
W. F. McKenney, 54 First Street, Portland, Ore.
J. H. Denton, 1328 Broadway, New York City, N. Y.
A. W. Arlin 519 Delta Bldg., Los Angeles, Cal

Why TEXACO CAR OILS offer wonderful insurance *against* HOT BOXES

Electric Car Oils should be *straight mineral.*

We can not state this too strongly.

Texaco Car Oils, being Straight Mineral, will not emulsify, will not become soapy, when water enters.

If you want to reduce the number of hot boxes on your road to a minimum (and a very low minimum), if you want to promote lubrication efficiency, save oil, save waste, save labor and reduce maintenance cost, specify TEXACO CAR OILS.

The reasons for the success of
TEXACO CAR OILS
are very plain:

1. They saturate the waste readily and drain properly.
2. They show no chemical reactions or separations in use.
3. They meet the bearing pressures and speeds encountered in the work.
4. TEXACO Car Oils are manufactured in two grades; one for summer, one for winter. This takes care of all atmospheric and operating temperatures.

We are ready, now, with ample stocks of summer car oils, and shall be glad to cooperate with you to reduce the number of hot boxes on your road—or to improve lubrication all along the line.

That is just what we are doing on thousands of miles of first-class Street Railway properties throughout the country.

Immediate delivery, anywhere, any time.

And remember:

There is a Texaco Lubricant for Every Purpose.

THE TEXAS COMPANY
Texaco Petroleum Products
Dept. E51, 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

INTERNATIONAL Creosoted Pine Poles insure safe and reliable service at low cost.

Creosoted Pine Poles are 44% stronger than other poles. Their great permanent strength assures longest life.

When their initial cost is distributed over their long years of service, the annual cost becomes remarkably low.

Creosoted Pine Poles are so far superior in strength that many prominent engineers use for a given load, a pine pole one inch less in top diameter than for poles of other kinds, maintaining the same factor of safety. As an alternative, the same size pole may be used but the length of span increased thereby reducing the number of poles per mile and lessening hardware and labor costs.

Frequent inspection of ***International*** Poles is unnecessary—another important feature which reduces the cost of maintenance.

Illustration shows International Creosoted Pine Poles in Beaumont-Port Arthur Interurban line in service of the Gulf States Utilities Co.

International Creosoting & Construction Co.
Galveston—Texarkana—Beaumont

STANDARD FOR SAFETY AND SERVICE

Good service means long wear. Safety means an ample margin of reserve strength. "Standard" Steel Wheels, Armature Shafts, Springs, and Axles are made to serve both well and safely under all conditions.

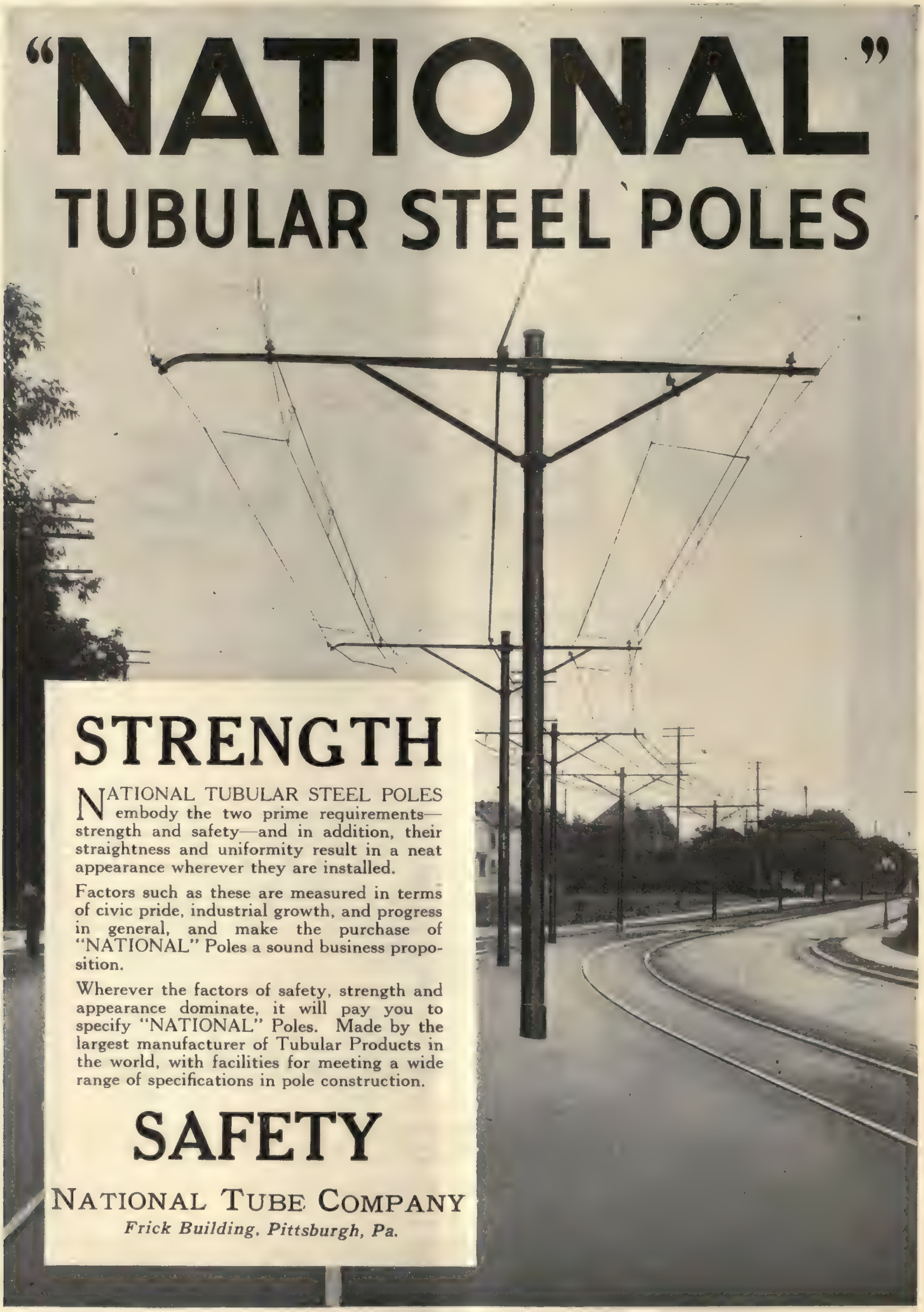
STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

BRANCH OFFICES

CHICAGO
ST. LOUIS
NEW YORK
HOUSTON
PORTLAND
RICHMOND
SAN FRANCISCO
ST. PAUL
PITTSBURGH
MEXICO CITY

WORKS: BURNHAM, PA.



"NATIONAL"

TUBULAR STEEL POLES

STRENGTH

NATIONAL TUBULAR STEEL POLES embody the two prime requirements—strength and safety—and in addition, their straightness and uniformity result in a neat appearance wherever they are installed.

Factors such as these are measured in terms of civic pride, industrial growth, and progress in general, and make the purchase of "NATIONAL" Poles a sound business proposition.

Wherever the factors of safety, strength and appearance dominate, it will pay you to specify "NATIONAL" Poles. Made by the largest manufacturer of Tubular Products in the world, with facilities for meeting a wide range of specifications in pole construction.

SAFETY

NATIONAL TUBE COMPANY
Frick Building, Pittsburgh, Pa.

Why 'Wrought Steel' makes superior Wheels

A 10,000 ton hydraulic forging press—(twenty million pounds!)—is one of the reasons why Wrought Steel gives you unusual service. To obtain Wrought Steel, the metal is first rolled into blooms which are cut to the desired length. These discs, after reheating, are forged into wheels under enormous pressure. The wheels then pass to a rolling mill where all surfaces are rolled. After cooling, the wheels are machined to exact dimensions. This process completed, there is no possibility of irregularity in the steel structure that could cause fracture. Wrought Steel assures to the user the longest life and the greatest possible safety. It is for this reason they are specified under Pullman and passenger cars in the steam railroad field.

Send for new booklet—
"Wrought Steel Wheels and Axles"

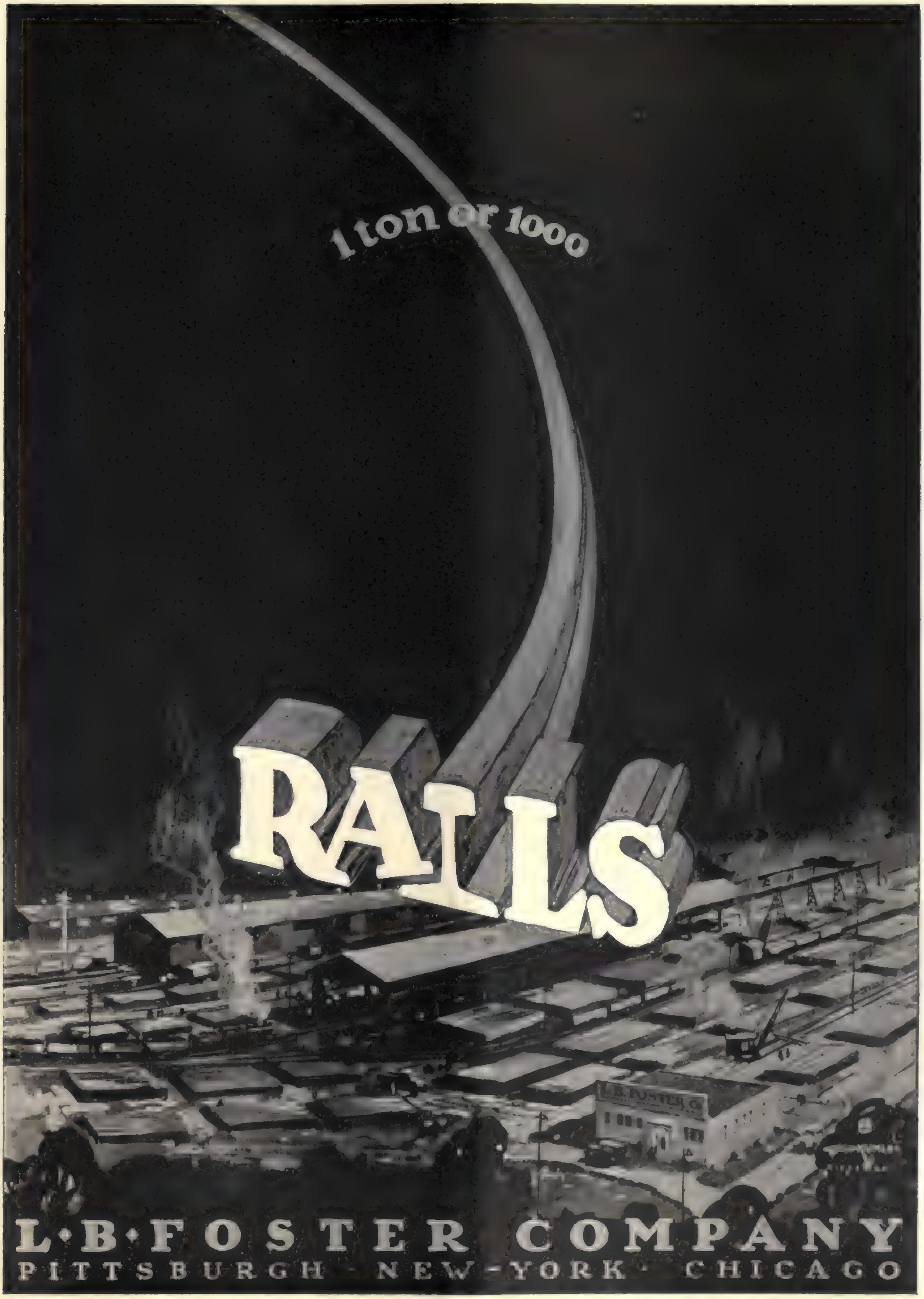
CARNEGIE STEEL COMPANY

General Offices • Carnegie Building • 434 Fifth Avenue
PITTSBURGH PENNSYLVANIA

1850

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

Barron G. Collier
INCORPORATED
CANDLER BLDG. NEW YORK


1 ton or 1000
RAILS
L. B. FOSTER Co
L·B·FOSTER COMPANY
PITTSBURGH · NEW-YORK · CHICAGO

The logical pavement *for* electric railway service now yours at less cost

Brick for endurance—brick for easy track changes and repairs—brick for high salvage—these have always been the reasons why electric railway companies have preferred vitrified brick pavements. Now another incentive is added—*brick pavements at lower first cost.*

The last iota of doubt as to the ability of thin brick to stand the gaff of modern traffic loads is forever erased by the government-made test at Arlington, outside of Washington, D. C., the most rigorous and searching test ever applied to any pavement. The official findings introduce a new era in paving practice.

Whether or not you have an immediate paving requirement, you will want a complete copy of the official report—figures, facts and photographs—for careful reading and for your files. A copy will be gladly supplied you without charge if you will simply send your name and address to the address below.

NATIONAL PAVING BRICK
MANUFACTURERS ASSOCIATION
ENGINEERS' BUILDING, CLEVELAND, OHIO

VITRIFIED Brick

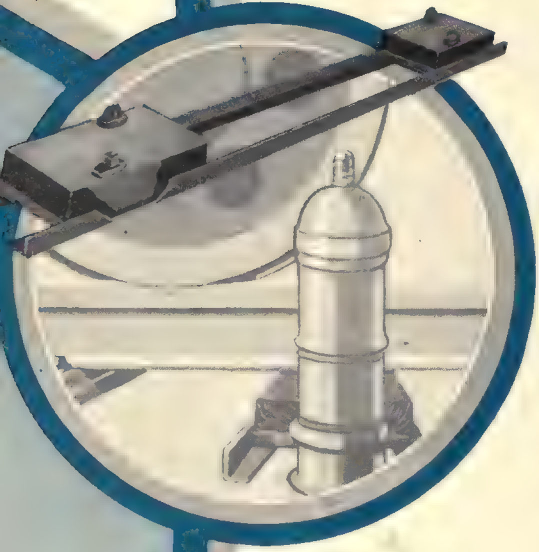
6 point service

1 absorbs impact at rail joints
2 water-seals road-bed and ties
3 allows for contraction and expansion
4 resists heaviest traffic
5 is easily removable
6 has practically 100% salvage value

You know modern rolling stock pays...

But how about modern track?

The Dayton Mechanical Tie Co.,
DAYTON, OHIO



Dayton Ties
Put Shock
Absorbers
Under Your
Tracks

Dayton Tie Track Pays

in elimination of track maintenance—reduction of rolling stock maintenance and more patronage

The case for modern rolling stock becomes progressively clearer as more and more properties try it—it is a paying proposition.

The case of modern track, such as is provided by Dayton Mechanical Ties, is even more clear cut.

You know what track maintenance costs you. Suppose that charge were entirely wiped out for the next 15 years or more.

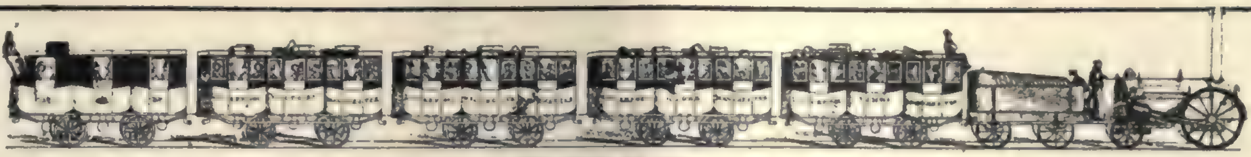
Dayton Ties will do just that for you. Since their inception 15 years ago, no track laid on them has failed or cost a penny of maintenance.

Moreover the vibration absorption feature embodied in the construction of Dayton Ties is remarkably easy on rolling stock—it stays easy, for the track stands up and remains smooth.

The smoothness also attracts patronage, just as rough track drives it away.

Dayton Tie Installations are spread over the whole country—there is one handy to you. Why not ask us where it is and then inspect it personally?

The Dayton Mechanical Tie Co.
Dayton, Ohio



A Big Step from the Equipment Illustrated
to the Heavy Tonnage Equipment of Today

Rolling Along

Millions
and Millions *of*
Chilled
Tread Wheels

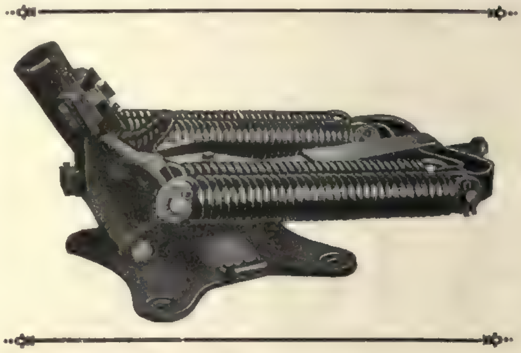
Time and Experience have only
popularized the Chilled Tread Wheel
One Wear—One Cost—Better Every Year

A. R. A. Standards
650-lb. Wheel for 30-ton Cars
700-lb. Wheel for 40-ton Cars
750-lb. Wheel for 50-ton Cars
850-lb. Wheel for 70-ton Cars

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
1847 McCORMICK BUILDING CHICAGO

50 Plants—Daily Capacities 20,000 Wheels

Do You Think You Could Build a Nuttall Trolley?



You doubtless could if you knew what grade of metal to put in the foot, the swivel, the pole socket, etc.—if you knew where they had to be reinforced to withstand strains and where they had to be lightened to keep down weight; if you knew a reliable foundry that could furnish suitable castings; if you had $60,000 worth of special machinery, tools, jigs, reamers, drills, etc., but even so, if you didn't have 35 years of experience and a crew of skilled mechanics you couldn't *equal* a Nuttall Trolley. So why should you think anyone else could?

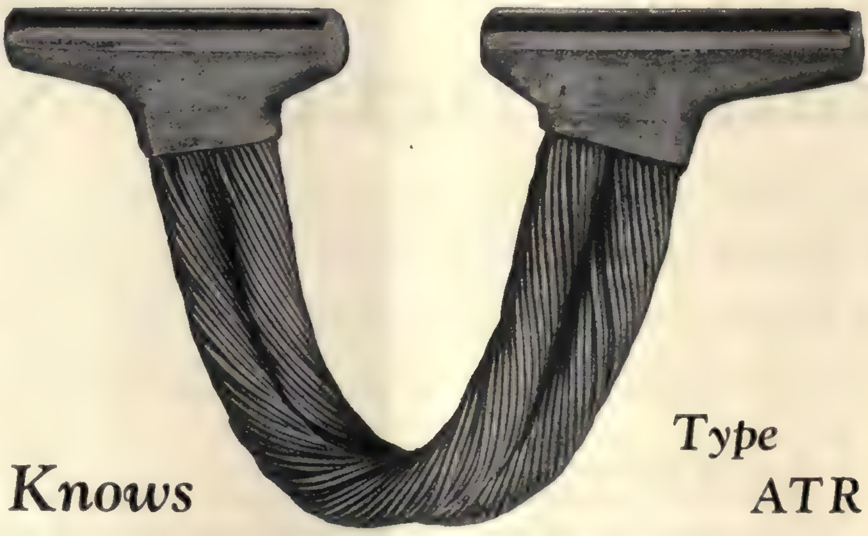
Why should you buy just trolley poles, trolley harps, trolley wheels? If they cost less than Nuttall's its poor economy anyhow because they are worth less. And it is worth something *more* to get with your purchase the feeling of confidence inspired by a product you know is *right.*

Buy genuine Nuttall Trolley parts, poles, wheels, harps, from Nuttall.

R.D.NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

MEMBER AERA 1927



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The arc flashes down between the round terminal and the rail and clings without sputtering.

It is easy to hold a short arc, and every welder knows that a short arc and a good weld go hand in hand.

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Facts About a Remarkable Bolt

1 Its threads are as accurate as those of a hardened and ground gauge.

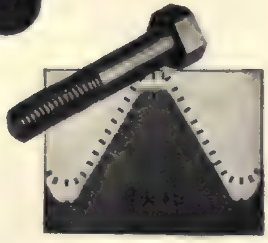
*2 Its minimum tensile strength is 80,000 lbs.

3 It is cold-headed yet the head will not come off.

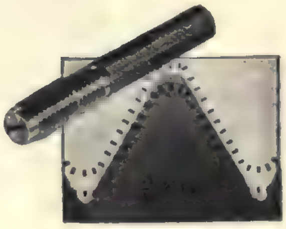
4 It resists the effects of moisture and dampness.

5 It is exactly identical with every other Empire Bolt of the same size and style.

6 It saves time in assembly and reduces scrap to a minimum.



This is the thread profile of an Empire New Process Bolt as projected by the screw thread comparator.



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This represents an advance in manufacturing that is unusually important.

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By insuring collection of the right fare and by making an indelible record of each transaction, the Ohmer fully protects the company. It affords complete, simplified data for the auditor's office. The slighest discrepancy is at once apparent. This system prevents errors and removes temptation. It's a convenience and a safeguard for all parties concerned.

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FIRST-CLASS draftsman, familiar with steam and electric car truck design and manufacture. Answer stating age, experience and salary expected. P-988, Electric Railway Journal, Tenth Ave. at 36th Street, New York.

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ACCOUNTING executive with experience in all departments railway, electric and gas properties, capable of assuming full control of accounting and financial matters, seeks opening. PW-2, Electric Railway Journal, Tenth Ave. at 36th St., New York.

ENGINEER, 10 years' experience in design and operation of railway and power equipment, desires position with railway or power company with opportunity for advancement; Middle West preferred. PW-997, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

EQUIPMENT superintendent in the maintenance of all types of electric cars and buses, who has and can show results, desires for personal reasons to make a change. PW-5, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

GENERAL manager available. Technical graduate, broad experience both city and interurban, also light and power properties. Excellent record in straightening out labor difficulties, maintaining harmony and reducing operating costs. Particularly successful in public relations work. PW-3, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

GENERAL superintendent, technical and practical, competent and successful; fifteen years' experience; salary five thousand dollars. PW-1000, Electric Railway Journal, Tenth Ave. at 36th St., New York.

MASTER mechanic of character and ability, 20 years' experience on city and interurban property, desires to make a change for personal reasons. Best of references, correspondence solicited. PW-993, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

MR. MANAGER. If you are not satisfied with earnings, operating costs, efficiency, co-operation of employees and general conditions. If you have an opening or contemplate changes in your organization, a reply to this advertisement will place you in contact with a superintendent transportation, with broad experience, successful record, recognized ability, fine references, fully capable of getting results you desire. Correspondence and interviews invited and treated confidentially. PW-6, Electric Railway Journal, Guardian Building, Cleveland, Ohio.

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PRESENT manager of street railway property in Middle West operating 70 cars and 65 buses, desires change for personal reasons. Forty-five years of age. Twenty years' practical experience. Correspondence solicited. PW-987, Electric Railway Journal, Bell Telephone Building, St. Louis, Mo.

PRESENT superintendent of railway property operating 30 cars and 10 buses, desires change. Practical experience in each of its departments. Best of references. Correspondence solicited. PW-4, Electric Railway Journal, Tenth Ave. at 36th St., New York.

RAILWAY executive, now employed, desires change; fifteen years' experience on property operating 75 cars; university graduate. PW-999, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

SUPERINTENDENT of railways with 20 years' experience, desires for personal reasons to make change. Nationwide reputation as railway operator, can take full charge. Has ability to handle men and show results. Correspondence invited and treated in confidence. PW-979, Electric Railway Journal, 7 South Dearborn Street, Chicago, Ill.

TRANSPORTATION superintendent, at present engaged in the East, desires to locate in Middle West; 23 years' experience. Age 44. References. PW-1, Electric Railway Journal, Tenth Ave. at 36th St., New York.

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AS-994, Electric Railway Journal,
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Elec. Service Supplies Co.
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More-Jones Brass Metal Co.

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Columbia Machine Works

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American Bridge Co.

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Nichols-Lintern Co.

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Willard Storage Battery Co.

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Columbia Machine Works
Stucki Co., A.

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Columbia Machine Works
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Le Carbone Co.
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International Motor Co.
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Bemis Car Truck Co.
Cincinnati Car Co.
Columbia Machine Works
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Irvington Varnish & Ins. Co.

Cambric Yellow and Black Varnish
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Cincinnati Car Co.

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Bethlehem Steel Co.

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General Electric Co.
Westinghouse E. & M. Co.

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St. Louis Car Co.

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St. Louis Car Co.
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Columbia Machine Works
St. Louis Car Co.

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Pantasote Co., Inc.

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Cement Accelerator
N. Amer. Cement Corp.

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Oakite Products

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Crossing Foundations
International Steel Tie Co.

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Bethlehem Steel Co.
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Wish Service, Edward P.

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(Continued on page 64)

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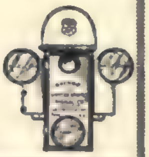

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Rail Grinders (See Grinders)

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Westinghouse E. & M. Co.

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Brill Co., The J. G.
Cincinnati Car Co.
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Scrapers, Track (See Cleaners and Scrapers, Track)

Screw Drivers, Rubber Insulated
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Brill Co., The J. G.
Haskelite Mfg. Corp
Pantasote Co., Inc., The
St. Louis Car Co.

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Seats, Car (See also Rattan)
Brill Co., The J. G.
Cincinnati Car Co.
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Cumberland County Pur. & Lt. Co.
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(Continued on page 66)

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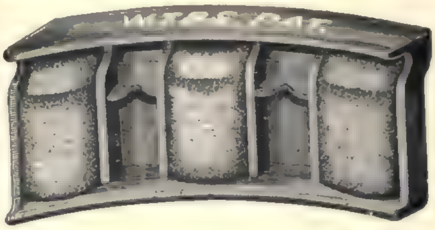

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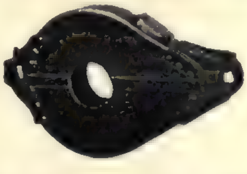

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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page
American Brass Co., The 63
American Bridge Co. 60
American Car Co. 67
American Electrical Works 63
American Insulating Machinery Co. 65
American Steel & Wire Co. 63
American Steel Foundries 6
Anaconda Copper Mining Co. .. 63
Anderson Mfg. Co., A. & J. M. . 55
Archbold-Brady Co. 59
Association of Mfrs. of Chilled Car Wheels 51

Babcock & Wilcox Co. 59
Baker-Raulang Co., The 35
Bates Expanded Steel Truss Co. 59
Beeler Organization 58
Bemis Car Truck Co. 40
Bethlehem Steel Company 60
Bibbins, Roland J. 58
Brill Co., The J. G. 67
Buchanan & Layng Corp. 58
Buda Co., The 60

Cameron Electrical Mfg. Co. 63
Carnegie Steel Co. 45
Chillingworth Mfg. Co. 65
Cincinnati Car Co. 17
Cleveland Fare Box Co. 56
Collier, Inc., Barron G. 46
Columbia Machine Works & M. I. Co. 57
Consolidated Car Fender Co. ... 65
Consolidated Car Heating Co. ... 59
Cumberland County Pwr. & Lt. Co. 61
Cummings Car & Coach Co. 39

Day & Zimmermann, Inc. 58
Dayton Mechanical Tie Co., The Insert 49-50

Page
Differential Steel Car Co., The .. 65
drum & Co., A. L. 59

Earll, C. I. 54
Economy Electric Devices Co. .18-19
Electric Equipment Co. 61
Electric Ry. Equipment Co. 63
Electric Railway Improvement Co. 52
Electric Service Supplies Co. .. 9

Firestone Tire & Rubber Co. 28
Ford, Bacon & Davis 58
"For Sale" Ads 61
Foster & Co., L. B. 47

General Electric Co. .22, Back Cover
Goodrich Rubber Co., B. F. 25
Gold Car Heating & Ltg. Co. ... 65
Graham Bros. 24
Griffin Wheel Co. 55

Hale-Kilburn Co. 34
Haskelite Mfg. Corp. 59
"Help Wanted" Ads 61
Hemphill & Wells 58
Holst Englehard W. 58
Hubbard & Co. 63

International Creosoting Co., The 42
International Harvester Co. 27
International Motor Co., Insert 29-30-31-32
International Oxygen Co. 59
International Register Co. 56
International Steel Tie Co., The. 7
Irvington Varnish & Insulator Co. 56

Jackson, Walter 58
Jeandron, W. J. 54

Page
Kelker, DeLeuw & Co. 58
Kelly, Cooke & Co. 59
Kuhlman Car Co. 67

Lang Body Co. 61
LeCarbone Co. 54
Leece-Neville Co., The 33
Linn & Marshall, Inc. 58
Lorain Steel Co. 60

Mack Trucks, Inc., Insert 29-30-31-32
McClellan & Junkersfeld 58
McGraw-Hill Co., The 36-37
Metal & Thermit Corp. 38
Mica Insulator Co. 57
Morganite Brush Co. 55
Motor Wheel Corp. .....Front Cover
More-Jones Brass and Metal Co. 57

Nachod and United States Signal Co., Inc. 63
National Brake Co. 23
National Paving Brick Mfrs. Assn. 48
National Pneumatic Co. 15
National Ry. Appliance Co. 60
National Tube Co. 44
Naugle Pole & Tie Co. 63
Nichols-Lintern Co., The 65
Northern States Power Co. 61
Nuttall, R. D. 52

Oakite Products, Inc. 56
Ohio Brass Co. 5
Ohmer Fare Register Co. 54
Okonite-Callender Cable Co., Inc., The 63
Okonite Co., The 63

Pantasote Co., Inc. 57
Perey Mfg. Co., Inc. 59
Positions Wanted and Vacant ... 61

Page
Railway Track-work Co. 4
Railway Utility Co. 65
Ramapo Ajax Corp. 59
Ransom, Edward D. 61
Richey, Albert S. 58
Roebling's Sons Co., John A. .. 63
Russell Burdsall & Ward Bolt & Nut Co. 53

St. Louis Car Co. 20-21
Safety Car Devices Co. 8
Samson Cordage Works 63
Sanderson & Porter 58
Searchlight Section 61
Smith Heater Co., Peter 59
Standard Steel Works Co. 43
Star Brass Works, The 60
Stevens & Wood, Inc. 58
Stone & Webster 58
Stucki Co., A. 65

Texas Company, The 41

Una Welding & Bonding Co. 59
Union Switch & Signal Co. 16
Universal Lubricating Co., The .. 65

Van Loan Corp., Irving S. 61

"Want" Ads 61
Wason Mfg. Co. 67
Westinghouse Elec. & Mfg. Co. . 2
Westinghouse Traction Brake Co. 10
Wharton, Wm., Jr. & Co., Inc. . 60
"What and Where to Buy," 62-64-66
Wheel Truing Brake Shoe Co. .. 65
White Eng. Corp., The J. G. ... 58
Willard Storage Battery Co. 26
Wish Service, The P. Edw. 59
Wood Co., Chas. N. 63
Yellow Truck & Coach Mfg. Co., Insert 11-12-13-14

WHAT AND WHERE TO BUY—Continued from page 64

Spikes
Amer. Steel & Wire Co.

Splicing Compounds
U. S. Rubber Co.
Westinghouse E. & M. Co.

Splicing Sleeves (See Clamps and Connectors)

Springs, Car and Truck
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Stokers, Mechanical
Babcock & Wilcox Co.
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Nichols-Lintern Co.

Storage Batteries (See Batteries, Storage)

Strain, Insulators
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Electric Service Supplies Co.
Ohio Brass Co.
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Strand
American Steel & Wire Co.
Roebling's Sons Co., J. A.

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Cummings Car & Coach Co.

Superheaters
Babcock & Wilcox Co.

Sweepers, Snow (See Snow Plows, Sweepers and Brooms)

Switch Stands and Fixtures
Ramapo Ajax Corp.

Switches, Selector
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Switches, Tee Rail
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Switches, Track (See Track Special Work)

Tampers, Tie
Railway Track-work Co.

Tapes and Cloths (See Insulating Cloth, Paper and Tape)

Tee Rail Special Track Work
Ramapo Ajax Corp.

Telephone and Telegraph Wire
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Telephones and Parts
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Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)

Thermostats
Consolidated Car Heating Co.
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Elec. Service Supplies Co.
More-Jones Brass Metal Co.
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Trolley Wheels (See Wheels, Trolley)

Trolley Wheel Bushings
More-Jones Brass Metal Co.
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American Brass Co.
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Anaconda Copper Min. Co.
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Wheel Grinders
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Wheels, Motor
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Wheel Presses (See Machine Tools)

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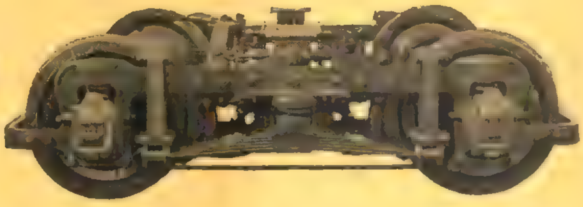

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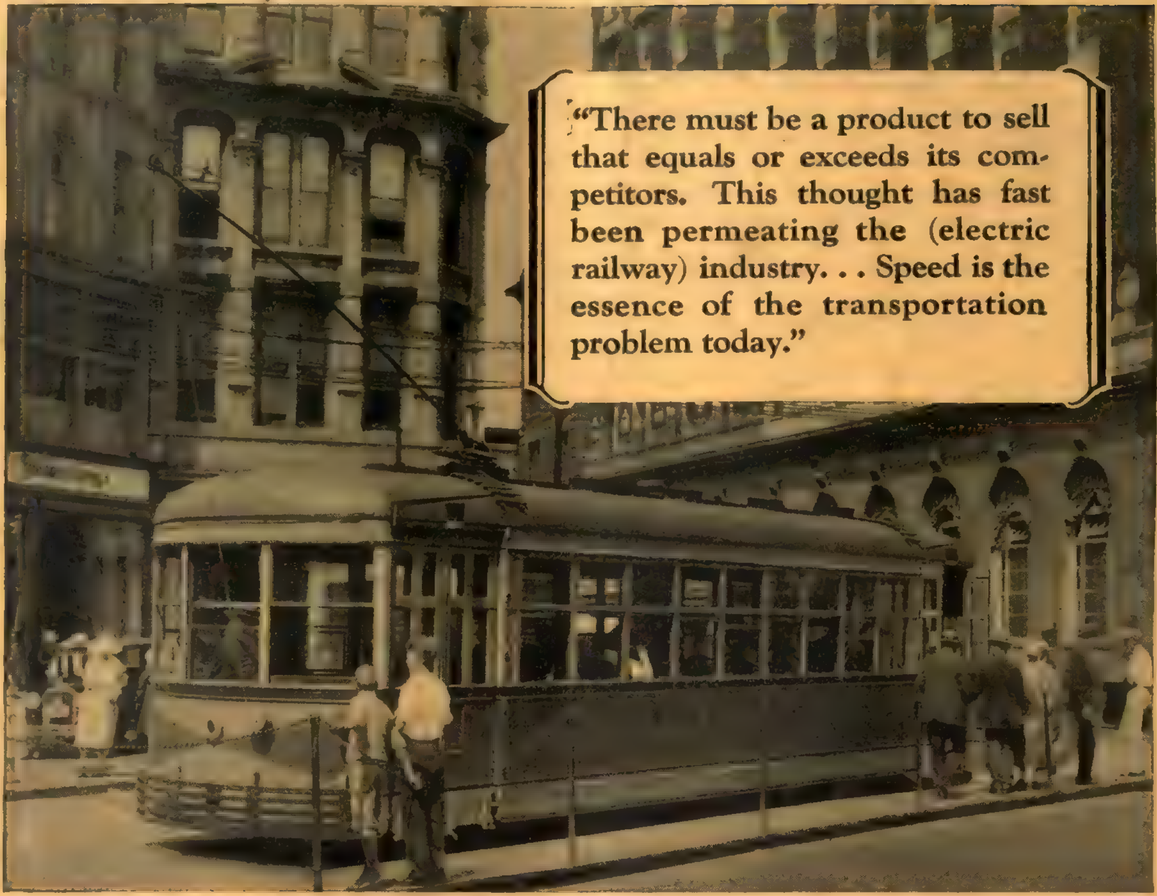

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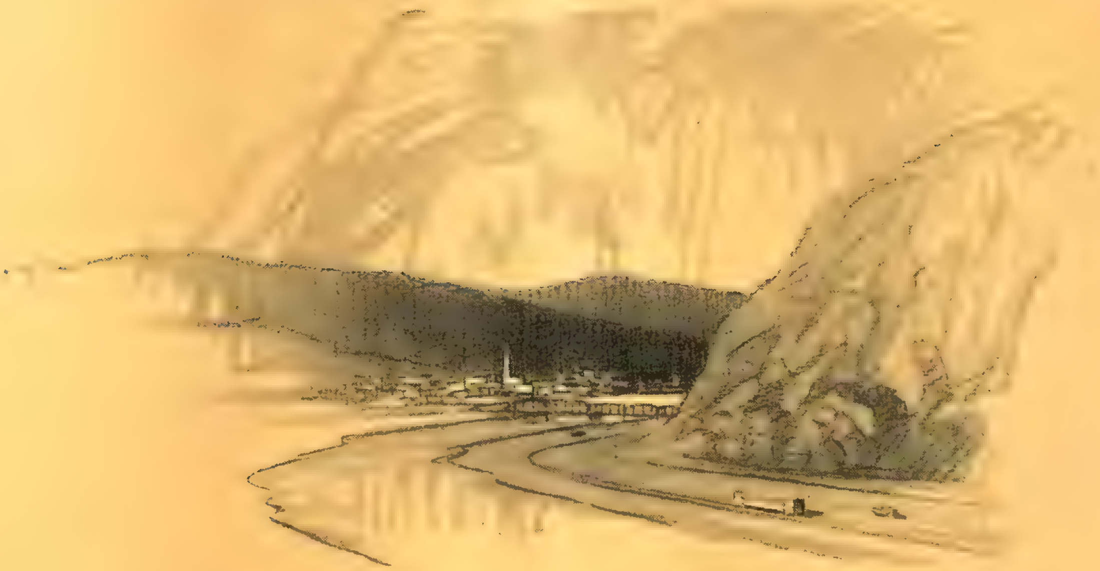

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Vol. 69
No. 20

CONTENTS

Pages 849-890

MAY 14, 1927

Editorials 849

Railway Revenue Increasing 852

Survey of conditions on 24 important electric railway properties in Canada shows marked improvement over those prevailing a year ago. Bus operation developing slowly.

First Aid School Has 335 Graduates 857

St. Louis Building and Loan Association Thrives ..858

A Short Life and a Sorry One for Melbourne's Jitney Buses 858

Australian tramway manager gives information on relative advantages of privately-owned and railway-owned service.

Tests of Worm-Drive Car Show Reduced Noise ...859

Initial tests with apparatus developed by noise reduction committee of American Electric Railway Engineering Association shows worm-drive car considerably quieter than conventional car. Additional features of brake, safety and door control equipment outlined.

Nashville Betters Accident Record 862

The company finished the year 1926 with a record of 286 "zero days" on which there were no accidents. Eighty trainmen participate in bonus for going through entire year without an accident.

New Automatic Substation for the Chicago Surface Lines 863

BY B. G. NOAH.

Supervisory control has important part in scheme of operation. No load shifting resistors are used. Comprehensive system of natural ventilation.

California Motor Transit Shows Declining Profits ..866

BY GEORGE K. MCCABE.

Railroad Commission reports reveal low and decreasing profits. Similarity to history of electric railway industry shown by comparison.

Plan Schedule Adjustments Now for Reduced Summer Riding 867

BY L. M. TRAISER.

The Readers' Forum 868

Maintenance Notes 869

Prize Contest Announcement 870

New Equipment Available 871

Association News and Discussion 872

U. S. Chamber of Commerce Frowns on Government Running Business 872

Private ownership and initiative seen as key to new and successful business era. There will be need for all forms of transportation.

Human Treatment of Worker Will Solve Problems of New Business Era 876

News of the Industry 877

Recent Bus Developments 881

Financial and Corporate 882

Book Reviews 884

Personal Mention 885

Manufactures and the Markets 887

The Patient Is Doing Splendidly

WITH mental scalpels and forceps, mortars and pestles, an army of "doctors of commerce" descended on Washington last week for the purpose of holding their yearly clinic over business through the medium of the fifteenth annual meeting of the Chamber of Commerce of the United States.

Experience has proved that such a gathering of clinicians, with such a distinguished patient, never fails to produce something of moment to the electric railway field. Considered in its broadest sense, all the ramifications of business are inseparably joined to the subject of transportation. For this reason, and in accordance with an established custom, the JOURNAL had observers on hand to cover every phase of the chamber's deliberations.

With the encouraging statement "the patient is doing splendidly," the JOURNAL invites attention to a comprehensive review of the meeting in Washington, which will be found elsewhere in this issue. Here is your opportunity to read the clinical thermometer, examine the fever and nourishment chart, and generally satisfy yourself as to the condition of a patient in which, it goes without saying, you are vitally interested.

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SAVING THE RAIL SAVES THE RAILWAY

Before buying new cars—

Check up on your track conditions. You know that even fine new cars will soon pound themselves to pieces on rough track.

You know that the finest cars in the world will be rough riders on rough track.

You know that your public will not prefer even new cars to their own motors if you don't provide comfort as well as scenery—and a fine car on rough track is about as useful as a "painted ship on a painted ocean."

So—take the first step first—fix up the track. Here's modern, economical equipment to help you.

Quotation?
By wire if you like.

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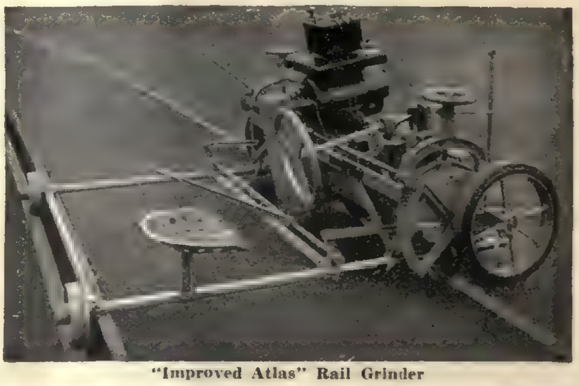
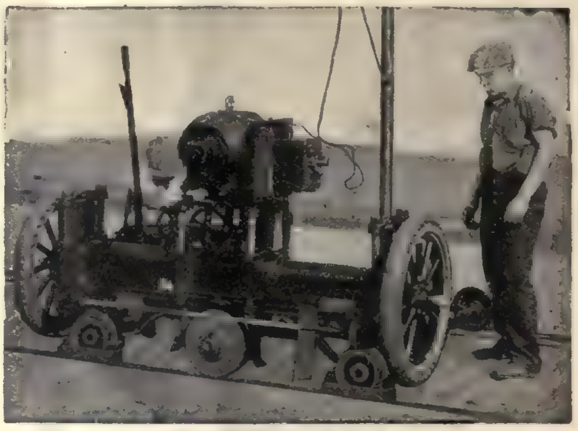
1816

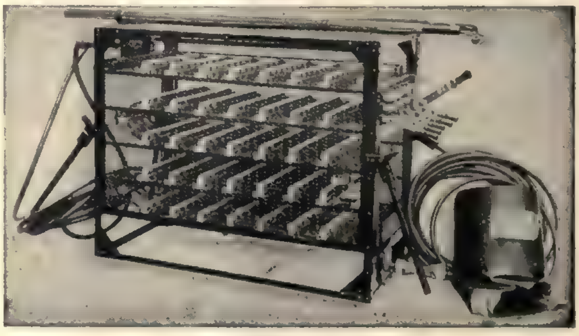


"Improved Atlas" Rail Grinder



"Imperial" Track Grinder

Reciprocating Track Grinder



"Ajax" Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY

Ideal Section of Chicago, South Shore and South Bend Railroad

40 Miles of O-B Catenary Materials in South Shore Line Rehabilitation

The new O-B General Catalog No. 20 contains much information on modern catenary construction. It includes data of value to every interurban operating official. Have you your copy?

TO GIVE permanency to its 40 miles of new catenary construction, recently erected as part of an extensive rehabilitation program, and to insure maximum freedom from service interruptions in operating its fast interurban trains, the Chicago, South Shore and South Bend Railroad specified modern O-B Catenary Materials throughout.

The new Catenary Overhead extends from Miller, Ind. to Kensington, Ill. It is of the combined contact and feeder system type and replaces in part an old O-B Catenary System that had been in service for nearly 20 years.

The use of O-B Catenary Materials makes possible a flexible contact wire, free from "hard spots," and combines good current collection with maximum economy of maintenance. If you are interested in the advantages of catenary overhead, O-B is at your service.

Ohio Brass Company, Mansfield, O.
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada

184 B

Ohio Brass Co.

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

BASIC IMPROVEMENT

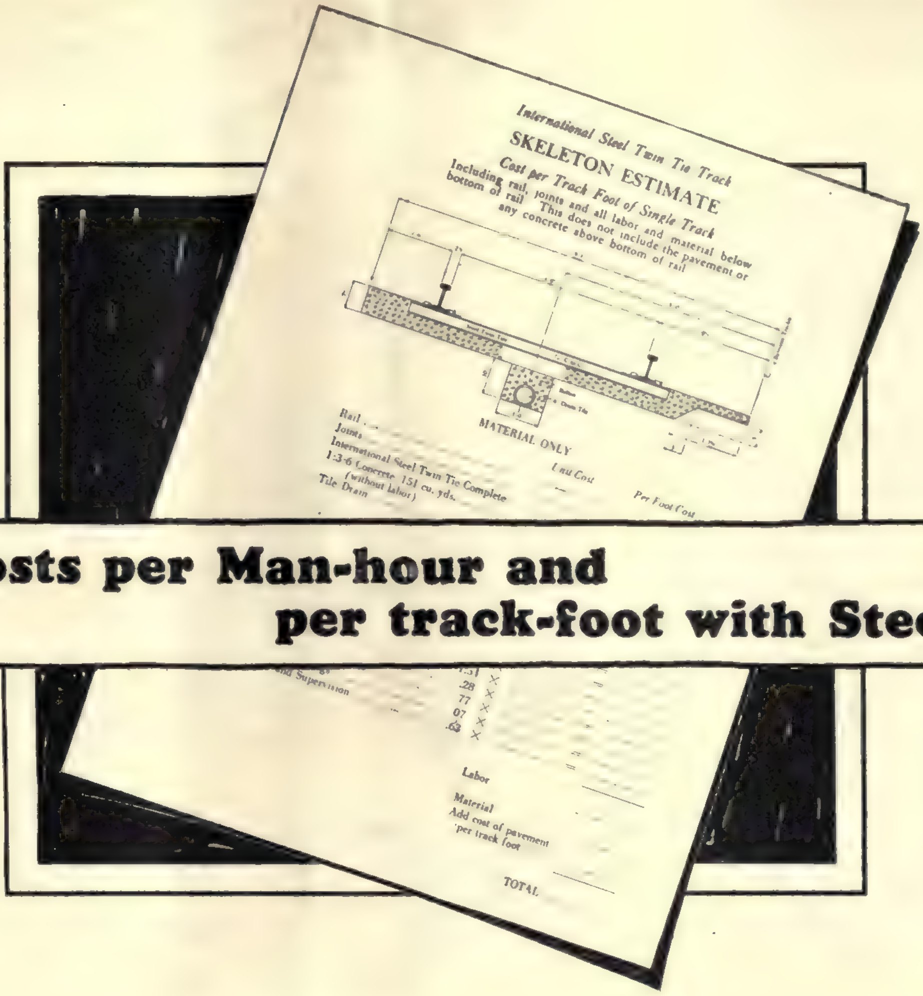
WHEEL performance can be no better than the material of which the wheel is made.

By using a special composition steel and heat-treating it to develop unusual qualities, the Davis "One-Wear" Steel Wheel gives long life without maintenance.

A new and different steel was necessary to make practical the "One-Wear" idea. Only the Davis Steel Wheel is made of this material.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS



International Steel Twin Tie Track

SKELETON ESTIMATE

Cost per Track Foot of Single Track

Including rail, joints and all labor and material below bottom of rail. This does not include the pavement or any concrete above bottom of rail

MATERIAL ONLY

Unit Cost

Per Foot Cost

Rail

Joints

International Steel Twin Tie Complete

1:3-6 Concrete 151 cu. yds. (without labor)

Tile Drain

and Supervision

.28 ×

77 ×

07 ×

.63 ×

Labor

Material

Add cost of pavement per track foot

TOTAL

Track Costs per Man-hour and per track-foot with Steel Ties

DETAILED costs have been analyzed for Twin Tie Construction and boiled down into the man-hour estimate form shown above.

By substituting your local unit material figures and multiplying the man-hour time for various operations of Twin-Tie Construction by your local labor rate you can have a close estimate of the per foot initial outlay for this high class construction on your property.

You will need the delivered price on Twin Ties at your job, which we will send on request, including with the quotation several blank man-hour estimate forms.

Ask today for the delivered price on Twin Ties for your proposed work.

Over 56 miles of Twin-Tie Construction are already scheduled for 1927 in such cities as Detroit, Cleveland, Toledo, Washington, Boston, Philadelphia, Akron, Atlanta, Cincinnati, Kansas City, Tacoma, Havana, Baltimore, Norfolk and many smaller places.

The INTERNATIONAL STEEL TIE COMPANY
Cleveland, Ohio

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track

Coördination and Modernization

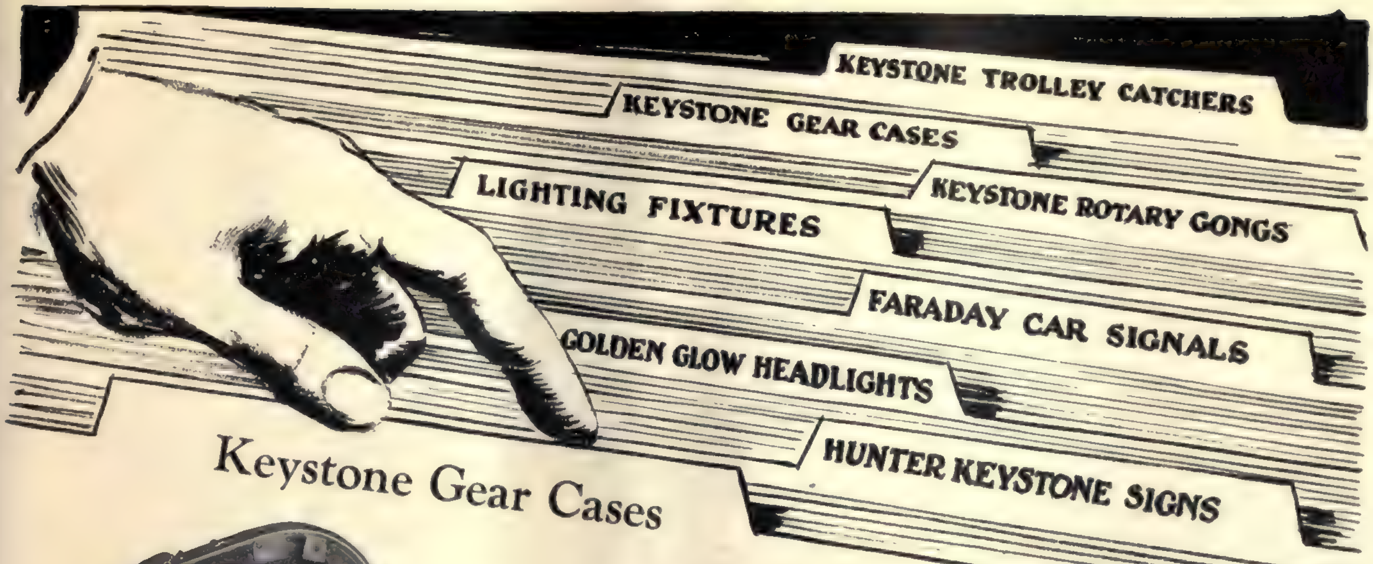
FOR over half a century the Westinghouse Air Brake Company, the largest manufacturer of braking devices in the world, has contributed to the development of transportation in all its branches.

Throughout the world are found installations by Westinghouse, whose invaluable knowledge of transportation problems and their solution, and coordination with the builders of transportation equipment, both in rail and highway fields, has evolved the modern equipment that plays such a large part in our transportation systems of today.

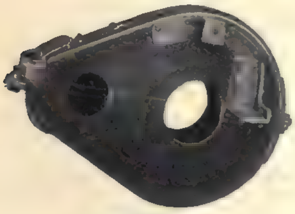
Modern commodious coaches, fleet as the trimmest roadsters in the highway, but with many times their bulk, are adequately controlled by the Westinghouse Automotive Air Brake, and despite their ability to reach high speeds are thus kept within the bounds of safety.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES



Keystone Gear Cases



To increase patronage, add attractiveness and efficiency to your cars by selecting your equipment from the broad line of Keystone Car Specialties.

Keystone Gear Cases

Made of soft, open-hearth, deep-drawing steel—tough enough to protect the gear and pinion and to absorb vibration—yet flexible enough to prevent serious accident. Both riveted and spot welded. Halves of any given type are interchangeable.

Get Catalog No. 7 for complete particulars of the full line of Keystone Equipment.

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SCRANTON
316 N. Washington Ave.

BOSTON
88 Broad Street

DETROIT
General Motors Building

Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

ELECTRIC SERVICE SUPPLIES CO.
MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

Three states and 77 municipalities have relieved electric railways from paving burdens according to a new Bulletin of the A.E.R.A. In most instances the relief granted was the cancellation of all paving and repaving requirements *except damage to surface paving occasioned by the operation of cars.*

And most of such surface paving damage occurs at rail joints!

Eliminate the joints and reduce paving costs to the minimum! Rail joints in paved track are unnecessary. Thermit welding eliminates the joints and with them the principal source of paving damage. It costs no more than other methods of joining rails and does a solid, permanent job.

No joints to get loose or pound! This preserves the paving surface and prevents water from getting under it to cause damage.

Thermit Welds are the best argument to secure relief from paving burdens.

METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.
PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

Extensive Bus traveling has produced many problems which have been solved by Lang Bodies

LANG BODIES
create new passengers

THOSE who ride in motor coaches today *expect* luxury and comfort in body appointments. They miss them if they are not present.

To combine the atmosphere of a private car with sturdy body construction that assures longer life, is the modern problem which is solved by Lang.

From the dainty panel mirror to the stout body work beneath the finish, Lang Bodies are built to produce more revenue for longer periods.

THE LANG BODY COMPANY, CLEVELAND, OHIO

"After all—
it's the Setting
that counts!"

Shorten Stops to Increase Earnings

Frequent stops pick up more passengers and add to revenue. But they also slow down schedules and increase expense. One might cancel the other. Through installation of N. P. Door and Step Equipment all stops are shortened to a point which avoids cutting into car miles or sacrificing schedule speed.

NP

NATIONAL PNEUMATIC COMPANY

Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

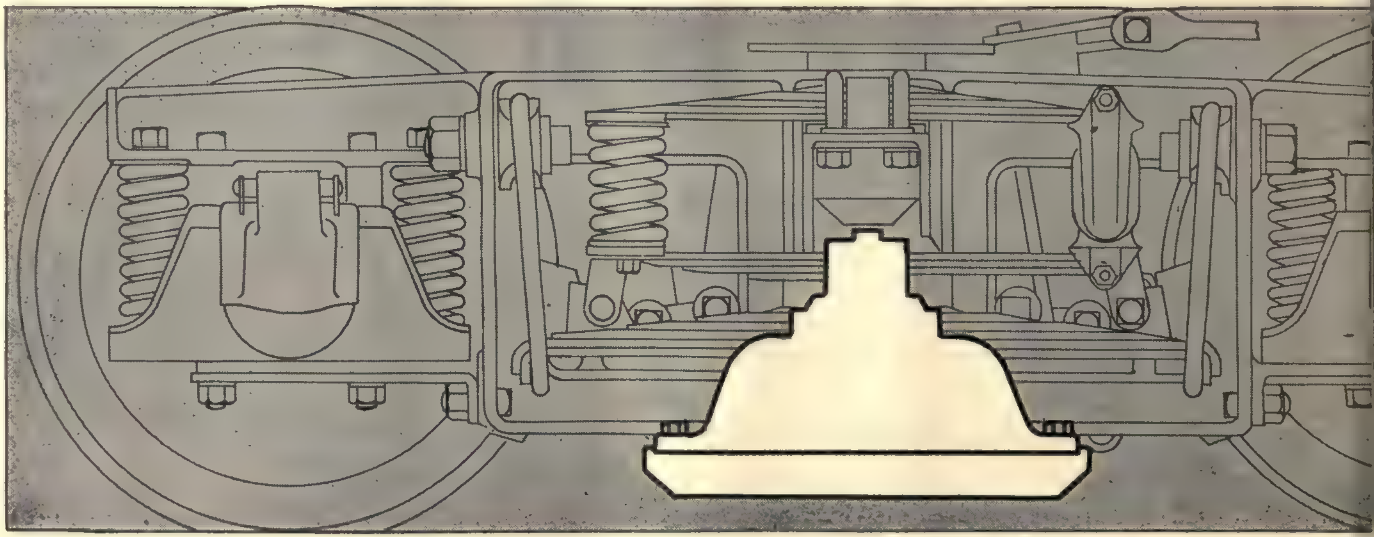
MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

Buffalo & Erie on July 20th

Underside view of the Cincinnati NEW High Speed Truck showing clearly the disposition of the Magnetic Brake equipment and the arrangement of the improved suspension to prevent sideway and nosing.

Heads of both rails on a straight section of track coated with heavy car oil for 700 ft. Car speed 45 mph. Car stopped in 470 ft. with application of both air and magnetic brakes. *Car went through 700 ft. oiled section and 85 ft. on dry track with air alone.*



Showing "idle" position of magnetic brake shoe well above the track. No delicate adjustments. The Magnetic brake itself goes far toward keeping track free from corrugations.

rrespective of track conditions

An outstanding feature of the new
DUPLEX AIR-MAGNETIC BRAKE

Many electric railway men do not yet fully realize what a revolutionary improvement in braking efficiency has been effected by the perfecting of the Magnetic Brake.

On the opposite page we give the results of tests conducted in 1925 by the Buffalo & Erie Railroad and these demonstrate clearly that not only will this system reduce emergency stopping distance 22.5 to 46%, **but that the brakes function with almost equal effectiveness whether the track be wet, dry or greasy.** Such conditions have always been troublesome. On the score of safety alone a great service has been done in overcoming them.

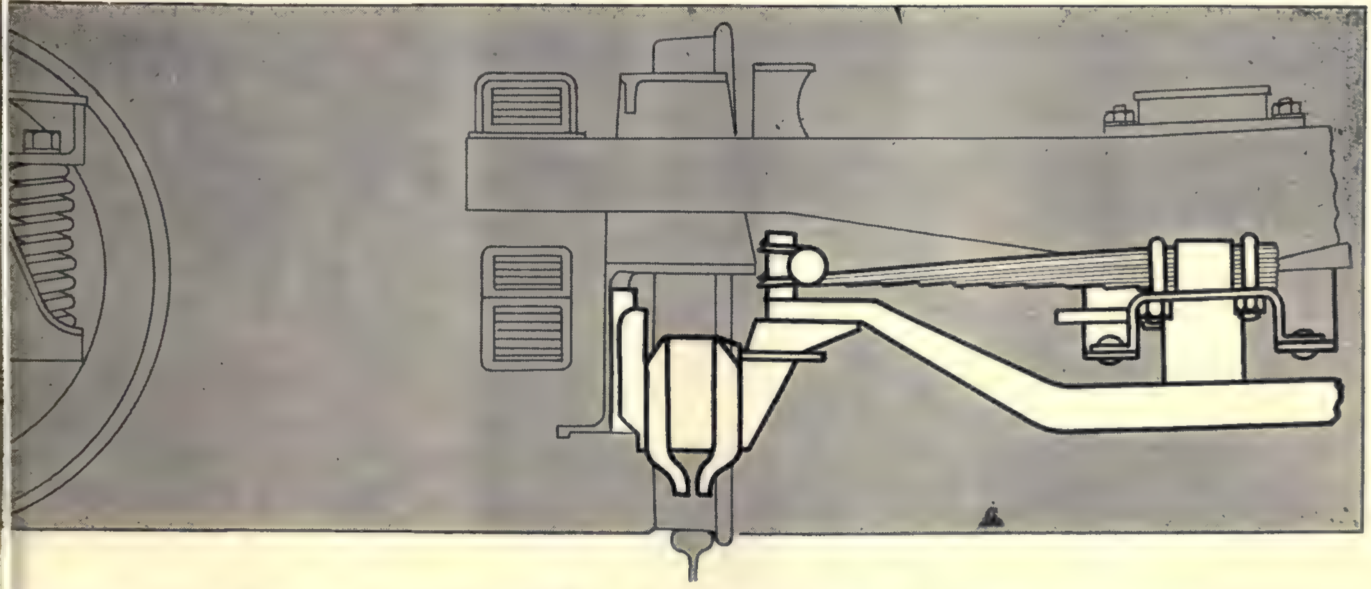
A further important feature of the magnetic brake, as now used, lies in the fact that the shoe is maintained well above the rails, being forced down by air pressure only during the time application is made. Thus the need for adjustment and careful rail maintenance, so necessary with earlier types of this equipment, is no longer present.

The Duplex Air and Magnetic System utilizes the standard method of brake operation with an M 28 Valve, the sander connection being used to operate the magnetic brake shoe circuits automatically when the brake valve is thrown to emergency. This arrangement also permits of independent operation if desired.

The Duplex Air & Magnetic Brake is presented as a part of Cincinnati BALANCED car DESIGN only after practical tests have proved its efficiency beyond doubt. We shall be glad to discuss its possibilities with any interested electric railway executive.

CINCINNATI CAR COMPANY
Cincinnati, Ohio

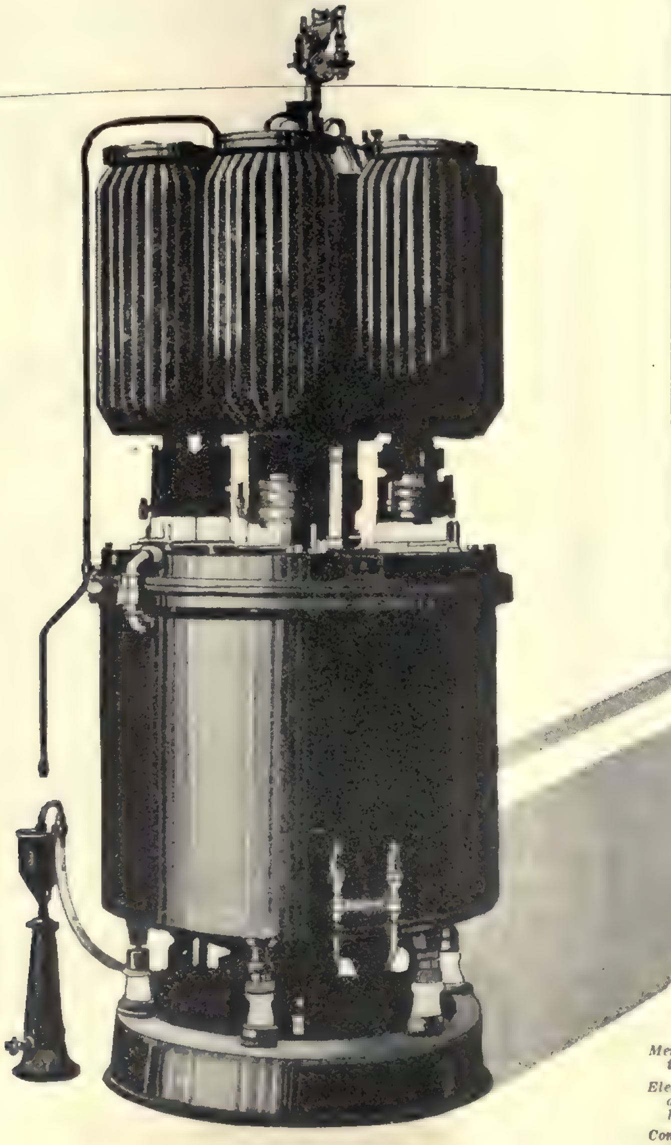
CINCINNATI
New
CARS



A step ahead of the modern trend

ABB

American
BROWN
BOVERI



Chief Advantages

(1) Efficiency high over the whole working range.

(2) Simple operation and minimum attention.

(3) No synchronizing.

(4) Very high momentary overload capacity and insensibility to short circuits.

(5) Negligible maintenance.

(6) Low weight. No special foundations.

(7) Noiseless and vibrationless operation, consequently rectifier substations can be erected in densely populated localities.

(8) New substations need only be of light construction. In many cases old houses can be converted, while the plant can often be erected in places that could not be considered for rotating machinery.

Principal Products

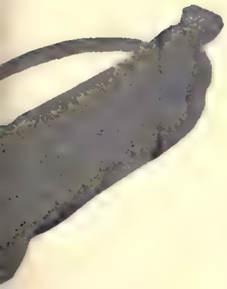
Mercury-Arc Power Rectifiers (steel enclosed)
Electric Locomotives—for any system of current, high or low tensions
Complete equipment for railway electrification
Complete equipment for indoor and outdoor substations
Rotary Converters
Motor Generators
Diesel-Electric Locomo-[illegible]
Automatic Regulators
Steam Turbo-Generators for normal or high pressures and superheats
Oil Switches and Circuit Breakers
Turbo-Compressors and Blowers
Transformers
Ships
  Diesel Driven
  Turbine Driven
  Electrical Driven
Dredges and Harbor Equipment

ABB

Mercury-Arc Power Rectifiers

Compact!

A word that means much when floor space is at a premium.



American Brown Boveri Mercury-Arc Power Rectifiers lend themselves to a compact, space-saving installation. Almost any available space is suitable. Put them in inexpensive subway niches, bury them under the street—they require no special foundations, give high efficiencies, are noiseless and vibrationless and will continue to perform with minimum attention.

Descriptive Circular No. 301 describes A-B-B Mercury-Arc Power Rectifiers. We will be glad to send you a copy so that you can have a fuller story of this equipment which the industry is buying.

American Brown Boveri Electric Corporation
165 Broadway, New York, N. Y. Camden, New Jersey
922 Witherspoon Bldg., Philadelphia. 842 Summer St., Boston. 230 South Clark St., Chicago.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA
1927

AMERICAN BROWN BOVERI

At Last—

Permanent Track—

Concrete Plus Dayton Ties

CONCRETE is the ideal foundation for anything— if you give it a chance. Like anything else, however, it must have correct conditions, or its virtues will be lost to the user.

In the thickness economically possible under street railway track, concrete absolutely will not stand vibration for any length of time. Countless tests have demonstrated that beyond any reasonable doubt. You must have something between the rail and the tie which will absorb this vibration.

Dayton Ties meet this need exactly. Built into them is a means of absorbing vibration, which has already demonstrated its power to preserve the concrete foundation far beyond a decade.

Dayton Ties have been tested repeatedly by service under the heaviest traffic to be found. Since their inception 15 years ago, no track laid on them has ever failed, or cost a penny of maintenance.

Before you place another order for Ties, get all the facts on Dayton.

The Dayton Mechanical Tie Co.

Dayton, Ohio

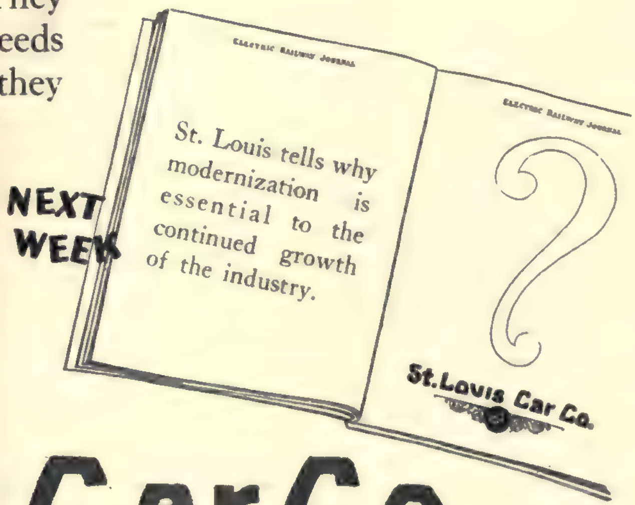
Here it is!
a catalog that illustrates cars that are making money for their operators
St. Louis Car Co.
Quality Cars

Last week—a catalog

Today—these cars are performing and producing results—results that pay their operators handsomely.

Each type of car is playing its part in bringing electric railway transportation up to date. They are designed and built to meet the specific needs of traffic conditions on the properties where they are operated.

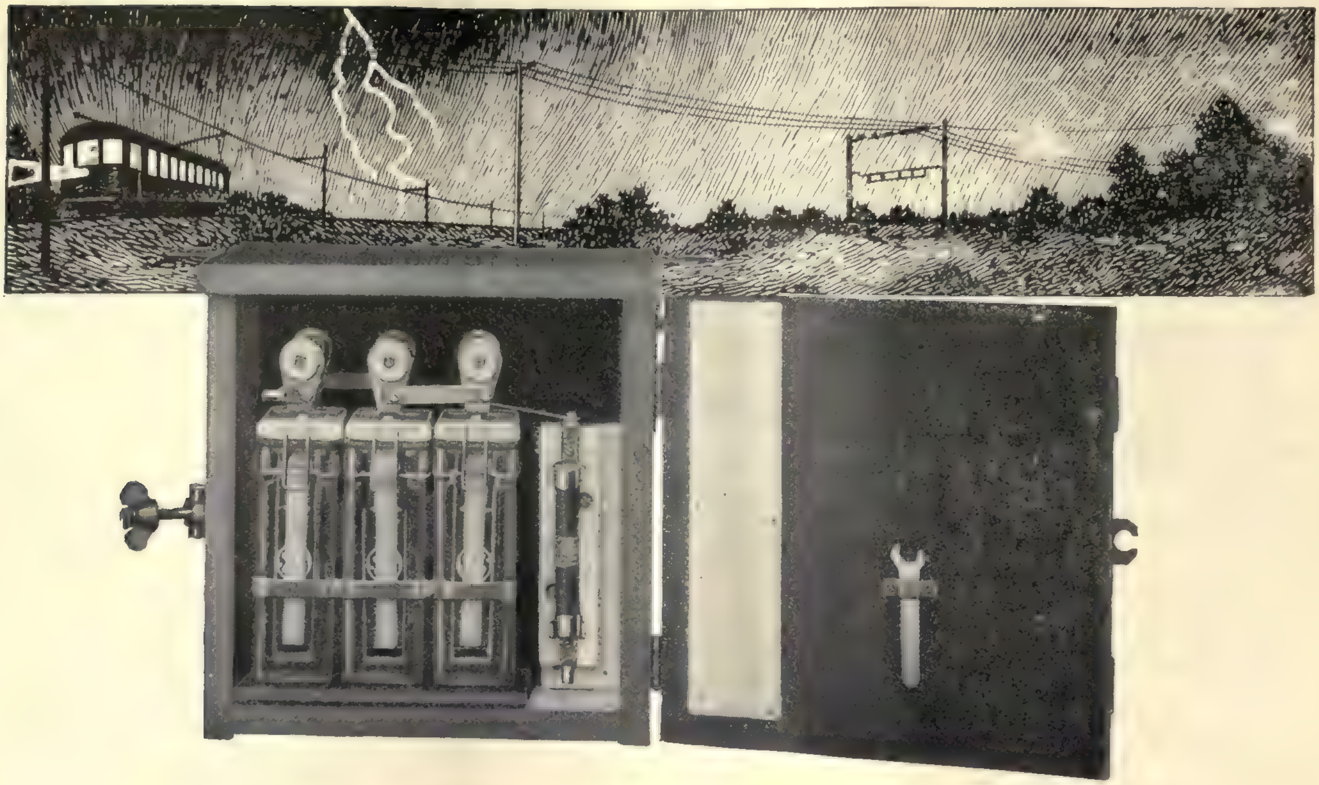
And behind each car is forty years' experience of the Quality Shops—experience which is yours to use in popularizing your property.



St. Louis tells why modernization is essential to the continued growth of the industry.

St. Louis Car Co.

Quality Cars



The New Aluminum Arrester for Railway Service

Simplicity and accessibility are two valuable features of this new General Electric D-c. Aluminum Arrester. Master mechanics are sure to be pleased with it.

The high degree of protection given by the d-c. aluminum type of arrester is widely known. In this new arrester the voltage per cell has been reduced one third. This means longer life and fewer replacements.

The new cells with their balancing resistances can easily be placed in the boxes of units now in service. Although these improved arresters have just been put on the market, they have been tested for two years on various railway properties.

General Electric originated the d-c. aluminum type of arrester and now introduces a notable improvement. The famous G-E high-voltage laboratory has been of material assistance in the development of all G-E lightning protective equipment.

442-6

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 14, 1927 *Number* 20

Fire Protection of Bus Garages Demands Serious Attention

REGULATIONS for the construction and operation of bus garages have been under consideration for some time by the National Fire Protection Association. A committee of this organization has made a study and recently presented a progress report, which in substance is the third draft of a set of regulations. Since electric railways have become large operators of buses the subject has become of increased importance to the industry, and the American Electric Railway Association has been given representation on the committee.

G. C. Hecker, the association's representative, in the May issue of *Aera* indicated that the tentative regulations do not meet with the full approval of many bus operators, and that there is a wide difference of opinion as to the methods of protection against fire that should be adopted. He felt it is desirable to get as comprehensive a discussion as possible.

In this issue of ELECTRIC RAILWAY JOURNAL is a communication by Howard H. George, chairman of the committee on ways and structures of the Engineering Association, under which comes the subject of garages. Mr. George mentions some of the objectionable clauses in these specifications. For instance, great stress is laid on so designing the garage that buses can be run out quickly in the event of a fire. With the explosive gasoline that is always present in large quantity, it is questionable whether in any garage fire it will be possible to start the engines and move out any considerable number of buses before the fire gains such headway that it is dangerous to life to attempt to move the vehicles. Then, too, many such fires occur at night and in cold weather. With the engines cold considerable time will be needed to run out even one bus, and with the small number of men who are available at night, when practically all are off duty, there is little chance that property can be saved in this manner.

Another instance of a clause that does not meet with the approval of operators is that which limits the height of any story for a garage to 20 ft. for single-deck buses and 25 ft. for double-deck buses. It is not evident that there is any need for this distinction, and still less likelihood that any operator of both types of buses will be able to restrict entire floors to one or the other. Similar questions apply to several other sections of the report, particularly those on type of fireproof construction for roofing, area of windows with respect to floor space, and methods of ventilation.

It is only by careful analysis of the report that the specifications can be written so as to be of the greatest good to the greatest number. Mr. George in his comment does not advocate practices which would increase the fire risk, but on the contrary he feels that certain modifications would result in a decrease in risk, while at the same time the ease of operation would be enhanced. Every bus operator and every garage designer should lend his assistance by making such suggestions as he considers will be constructive. In that manner only will it be possible to secure minimum fire risk with greatest facility in movement and ease of operation.

Electric Railway Business Flourishing in Canada

HIGHLY encouraging to the whole electric railway industry are the reports recently submitted by member companies to the president of the Canadian Electric Railway Association. From the Maritime Provinces on the east to British Columbia on the west railways record more passengers and greater revenue in 1926 than they had in 1925. In the entire Dominion only two railways report a decrease in business. Summaries of the statements of operating officials in practically all the important cities in Canada are given in an article elsewhere in this issue.

Reasons are numerous for the flourishing condition of the Canadian electric railways. The territory served by these systems has increased rapidly in population since the war. This is particularly true of the Western Provinces. In the east general business conditions have been good, especially that of the paper pulp mills. While the use of private automobiles has grown considerably, the increase has been less marked than in the United States. The comparative scarcity of well-paved roads has acted as a check on automobile popularity. So, also, have the severe winter weather conditions habitually encountered in many parts of the dominion.

Factors which have tended to discourage the use of the private automobile have hampered bus development, too. This has been both a drawback and an advantage. Despite conditions somewhat unfavorable to motor vehicle operation, extensive bus systems have been developed by the railways in Toronto, Montreal, Winnipeg and Vancouver. Others have gone into the bus business on a smaller scale. A number of railways are planning to expand their bus service in the near future.

From the viewpoint of limiting bus competition the difficult conditions have been fortunate, because the Canadians look more favorably upon competition in transportation than do the majority of people in the United States today. Duplication of service is permitted in many localities. The future of several small interurban railways is seriously threatened. That this situation should exist is surprising, because many of the Canadian railways are municipally owned. For the most part, however, the rail systems are furnishing a service for which no acceptable substitute has been found, and it is the general belief that they will continue to play the primary rôle in local transportation.

Plans are being made to extend and improve the service. Figures for passengers carried and revenue received during the first few months of 1927 show a continuation of the upward trend in evidence last year. Except in two or three of the smaller towns, prospects for the future are thought by the managements to be extremely bright.

A Determined Effort for Practical Patriotism

IT WAS indeed gratifying to an observer at the recent meeting of the United States Chamber of Commerce to hear repeated opposition to government control and interference with business. Likewise it is gratifying to note the stand taken by that body on the subject of federal, state and local taxation. The average American citizen has been busy so long making money that he has failed to grasp the seriousness of the situation in the city by the Potomac. The gradual aggression of federal government upon those inalienable rights guaranteed to the citizens is making the Constitution a scrap of paper. The repeated efforts by the government to operate business enterprises have resulted in a laughable exhibition of inefficiency and mismanagement. No matter how practical may be politicians, they are theorists when it comes to transacting business for a legitimate profit or for the good of the majority. For any arguments to the contrary, we offer the powerful rebuttal as revealed in the government's handling of the railorads; or, again, the building of cantonments during the war. Like the Alamo, they should be remembered.

There is a narrow, almost indefinable line between autocracy and democracy. In the history of the world the rise of any one person or party to power has been preceded by the overthrow of economic balance. The patriotism of a democracy then demands that business be divorced from the sphere of government. The safety of a republic lies in the right of every citizen for individual expression. Mathematically, a government is the sum of its citizens. No theoretical political structure has ever or will ever take raw material and convert it into useful and necessary products.

It is, therefore, a gratifying sight to see a body representing a cross-section of our citizenry demanding the right to conduct the nation's business along the lines of sanity, economics and individual liberty. For years we have put too much confidence in our new-hatched, unfledged spellbinders that yearly congregate under the dome on Capitol Hill. The chamber's action is a determined effort at practical patriotism.

A Human Engineer Proves His Case

MANY speeches made today may be described as wind pudding with rainwater sauce. The speaker with a real message is a *rara avis*. When one is encountered we always find a personality fired with the spirit of service and conviction; a personality thrice armed because its quarrel is just. Such a personality is found in Arthur T. Morey, whose speech on industrial relations before the recent meeting of the Chamber of Commerce of the United States is abstracted elsewhere in this issue.

A lawyer by education, general manager of the Commonwealth Steel Company by occupation, and a human engineer by conviction, Mr. Morey has found his greatest reward in the latter capacity by assisting a worker to find himself. Those who were privileged to hear his address came away with the feeling that he has brought practical Christianity into business. After Mr. Morey had outlined the work of his company in promoting a new era of industrial relations, one was convinced that he has proved that sentiment, citizenship, the aspirations and individualism of the work will loom large upon the horizon of greater business in the future.

Perhaps the most significant thing about the campaign of Mr. Morey and his associates lies in the fact that they have placed the development of the individual above what it cost to develop him. With the fetish of the almighty dollar eliminated, the program has gone forward with marked success, and, as usual, in the forgetting of self, the directors of the Commonwealth Steel Company, in the end, have reaped financial benefits.

In this particular it was a source of some amusement and keen gratification to an observer for the JOURNAL to hear the remarks of two industrialists who sat near him: "Aw, you can carry that thing too far," commented the gentleman who typified the age of "catch 'em young and treat 'em rough." His companion agreed with him, and the conversation was centered upon the question of how much it would cost. As if reading the minds of the two gentlemen, Chairman Brosseau arose when the speaker had finished and informed the gathering that he had asked Mr. Morey what was the financial result of the program, and Mr. Morey had replied, "Higher production and lower unit cost." In other words, the scoffers had been confounded, and a human engineer had proved his case.

What a Difference the White Caps Made!

VISITING a relative in another city where a new trolley manager had been functioning only a few weeks, a railway executive could not help casting a professional eye on the local scene. What impressed him most was the apparently insignificant fact that the trainmen were wearing white yachting caps! Indeed, he hardly had a chance to notice and approve this novelty before his relative and various townsmen began to brag about the sartorial initiative of the new manager. The white caps had no necessary connection with anticipated improvements in equipment and service, but were symbolic of better things to come.

Here is an example worth pondering. The new man wanted to create a favorable impression as quickly as possible. Rerouting, new schedules and new rolling stock would be a matter of months and put a strain on the public's expectancy, but the innovation of white yachting caps for summer wear could be put through almost overnight. The way the citizens greeted this change was beyond all hope.

It is a mistake to suppose that the people appreciate only big and splashy effects in public relations. The manager who bathtub-enameled his old cars pending receipt of new ones and the operator who first set out sidewalk benches to soften the annoyance of waiting for a car also spent relatively trifling amounts to strikingly good purpose. It is true that all three of these executives possessed the Heaven-sent gift of imagination, but with such and many other examples of like nature in the records of our technical societies and journals there is no reason why even the most unimaginative cannot pick some of them for his own use. Imitation of such examples is not only the sincerest flattery, but also good business for everybody concerned.

An Ohio Interurban Being Put Back on the Map

RESULTS achieved since the reorganization of the Cincinnati, Hamilton & Dayton Traction Company more than a year ago are fully up to expectations. It is true that the reorganization was a drastic one, but that is not the answer to the accomplishments. Other reorganizations have been quite as drastic. The story of success of the new management lies more in its militancy than in anything else. It is convinced that this 86-mile road can be put back on the transportation map, and the digest of the report of earnings published in the JOURNAL for May 7 makes it appear that its ardour for the task is ample.

The story has been so presented that he who runs may read. The need now is to emphasize only certain points. One of these is the part that new cars have played in the program of rehabilitation. Another is the realization of the value of freight as a revenue producer and the extent to which the management is prepared to go to cater to this business. Still another is the development of a public relations policy that contemplates the use of daily newspaper advertising and the publication of a house organ to keep the riders and others informed and interested.

There is nothing new in any of these things. They are all instruments to the end, panaceas only when properly used. And they have been properly used in the past by the very management that is now in charge of this property. That is what invests the recital of this story with value. Much more important than the sum would seem to imply is the figure of the final balance of $43,928 for the operation of the property from March 9, 1926, the date the reorganization became effective, to Dec. 31, 1926. Even sums of money are relative. Sizable sums are not to be judged entirely by the number of the digits they contain. Certainly any pride that may be felt by the management of the Cincinnati, Hamilton & Dayton Corporation on its accomplishments of the past year is pardonable.

One Out of Three Gets Across

JAY-WALKING will be discouraged in Chicago by the imposition of suitable penalties on the offenders, if the recommendations in a report recently made by the Albert Russel Erskine Bureau for Traffic Research are followed. Any pedestrian who crosses other than at a street intersection when the signal is given will be considered a jay-walker. Such a person not only endangers his own life but also creates a serious obstruction to vehicular traffic.

One often wonders just what the jay-walker intends to do with the few seconds he tries so hard to save. As a matter of fact, the investigation demonstrated that time seldom is gained by this kind of infraction of traffic rules. Checks made at typical intersections showed that more than half of the pedestrians held up by movement of cross traffic try to break through the stream against the signal lights, but that only one-third of those who make the attempt are successful. The rest are caught in a huddled mass in the center of the roadway between lines of moving vehicles.

The occasional success of the jay-walker who breaks through is more than offset by the continuous reduction in street capacity caused by pedestrians edging out into the roadway. Miller McClintock, director of the Erskine Bureau, states that studies made in the Chicago Loop district reveal a reduction in capacity from two lanes of traffic moving at 15 m.p.h. to one lane moving at 10 m.p.h.

Heretofore, objection to jay-walking has been based on the idea of preventing accidents, but the survey shows that the matter has another aspect of equally great importance. If the motive of safety has not been enough to discourage jay-walking, the evidence that little time is gained may be more convincing. For the remaining unbelievers, the penalties recommended may drive the lesson home.

Municipalization Recommended at Los Angeles

UNLESS things are not what they seem Dr. Delos F. Wilcox favors municipalization of the lines of the Pacific Electric Railway Corporation, Los Angeles, Cal. He thinks that the purchase price would be less than $30,000,000. He deems the purchase advisable on the ground that, among other things, the city would be freed from the jurisdiction of the Railroad Commission; that the cost of new capital would be limited to the rates paid on city bonds instead of the rate of return allowed by the Railroad Commission on private investments; that gross receipt and income taxes would no longer have to be paid. These are merely some of the things he cites in favor of the plan he advocates.

His is, of course, a counsel of affirmation, but even he, as a proponent of the measure, tacitly if not outwardly warned the city that Mr. Huntington, owner of the system, would insist on the fulfillment of certain stipulations intended to protect him against the uncertainties of the municipal ownership policies. Dr. Wilcox himself says that the good features of the present management ought by all means to be preserved in case the city should decide to take over the railway. This is, indeed, a timely warning.

The Los Angeles *Times* characterizes the Wilcox report as "vague in its conclusions and recommending no definite plan." It is true no definite plan is outlined, but that was hardly to be expected in a preliminary report. The author's warning about preserving the good features of the present management was made without reservation, and however imperfect the conclusions of the expert may be, he did not stub his toe over this factor. Dr. Wilcox may not see the same as others with respect to all the virtues of private operation and ownership, but his long service in consulting work and his contact with politics in his various studies of public life have impressed him with the need of caution in a direction in which caution is seldom exercised.

It is said that advice is given in bushels and taken in grains, but the very warning of the city's expert confirms the significance of the statements made by Managing Director Storrs with respect to the results with municipalization of its railways by the cities of Detroit, Seattle and San Francisco. As Mr. Storrs said at New Orleans, these three outstanding examples of what municipal ownership of electric railways means in the United States should be enough to warn any municipality against it. Los Angeles is still apparently a long way from municipal ownership. If the danger signal means anything, it should stop, look and listen a long while. And if it does that, it may save itself from itself.

Plaza in front of Union Station, Ottawa. Last year the Ottawa Electric Railway carried 1,500,000 more passengers than in 1925

Railway Revenue Increasing

Survey of conditions on 25 important electric railway properties in Canada shows marked improvement over those prevailing a year ago. Bus operation developing slowly

SUBSTANTIAL increase in gross revenue during the past year is reported by nearly every electric railway replying to inquiries made by W. R. Robertson, president Canadian Electric Railway Association. Included in this survey are twenty-five important railways in the provinces of Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. In all, these companies own more than 1,600 miles of track and operate approximately 3,500 cars.

Inquiry was made at the same time concerning the bus situation in the territory served by each of these railways. Answers indicate that development is proceeding slowly. Besides the thirteen Canadian railways operating buses at the first of the present year, however, a number of other companies have under consideration plans to establish bus service in the near future.

Receipts of the Nova Scotia Tramways & Power Company, Halifax, were 5.66 per cent greater in 1926 than in 1925, according to W. H. Munro, manager. He expressed confidence in the future of the industry and plans to spend money on new cars and track improvement year by year. Although this railway is not paying dividends at present it is gradually improving its earnings. It is hoped eventually to make it a profitable undertaking and indications are that this will be done in the near future if the general business activity of the district keeps on improving.

Another railway in eastern Canada, the New Brunswick Power Company, at St. John, reports that gross revenue for 1926 increased about $77,000 over the preceding year and revenue passengers about 140,000 in the same period. Mileage operated in 1926 was approximately the same as in 1925, namely, 1,200,000 car-miles.

According to M. A. Pooler, general manager, the increase in revenue occurred principally in the early months of 1926 and in December of that year. St. John is a city of walking distances and it is only with extremely bad conditions under foot that there is any large increase in railway traffic. This has been especially noticeable during the early months of 1927. The winter has been open and revenues have shown a downward trend. Favorable weather conditions have enabled automobiles to operate more easily and a greater number of licenses have been isued by the Department of Public Works thus far this year than for some time past. As a rule the majority of passenger car owners do not use their cars to a great extent until the early spring.

In view of these circumstances it is difficult, Mr. Pooler says, to make any prediction as to the outlook for the entire year of 1927. The railway's prosperity is dependent upon the prosperity of the community. If business improves the management hopes that it will be reflected in revenue. If the recommendations now before Parliament regarding the Maritimes are put through by the government it is expected that conditions will improve to a marked extent.

PROSPECTS BRIGHT IN THE PROVINCE OF QUEBEC

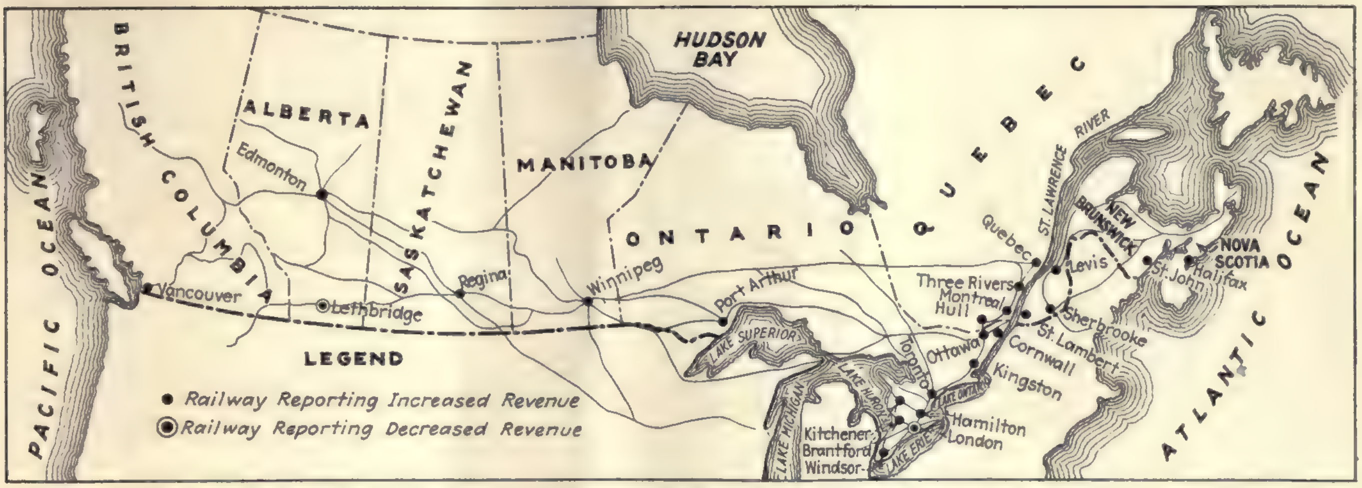
All signs point to much better conditions in and around Quebec than at any time since the close of the World War, in the opinion of J. E. Tanguay, general manager Quebec Railway, Light, Heat & Power Company. The past year has seen definite progress toward business improvement. Industrial activity has increased in many lines, with consequent increased employment in the building trades and greater spending power.

During 1926 the revenue of the railway increased 5 per cent over that for 1925, with a corresponding increase in the number of passengers carried. The early part of 1927 shows no change in this trend and the indications are that it will be a banner year. Prospects are good for heavy tourist traffic to Quebec during the coming summer. This is expected to result in increased patronage on the local railway lines as well as on the interurban line to St. Anne de Beaupré. It is hoped that new records may be made this summer in the number of passengers carried.

Across the St. Lawrence River, H. E. Weyman, manager Levis Tramways, says that electric railway conditions improved last year and the outlook appears favorable for the future, because there is much more activity generally in the Quebec and Levis districts than there has been since 1920. The earning power of the people has improved and electric railways are feeling this improvement. On the other hand, the private automobile competition was felt more last year than ever before. In spite of this the Levis Tramways was able to increase its revenue by publicity, maintenance of friendly relations with the public and a campaign to sell transportation.

Down near the American border the Sherbrooke Railway & Power Company states that for the year ended February, 1927, its gross earnings showed an increase of 10 per cent over the gross earnings for the year ended February, 1926. At Three Rivers the traction company has had a good year and the revenue has shown a marked increase. That district has been prosperous, due principally to the newsprint situation and the extensive construction program carried out by various paper mills. The population has been increasing steadily and indications are that 1927 will be another good year for the railway.

The outlook appears to be extremely favorable in the territory served by the Montreal & Southern Counties Railway, according to W. B. Powell, general manager. The number of passengers carried during the year 1926 was the largest of any year in the history of the company. So far this year traffic has shown an increase over the figures for the same period last year. In 1926 the operating ratio was 80.9 per cent, as against 81.8 per cent in 1925. General business in this territory is active and the population is increasing. Future prospects for the railways are encouraging.



From the Maritime Provinces on the east to British Columbia on the west Canadian electric railways report increased earnings

During the twelve months ended Dec. 31, 1926, gross passenger revenue of the Montreal Tramways increased 2.92 per cent over the same period of the previous year. For January, 1927, the increase was 3.86 per cent, for February 3.70 per cent and for March 3.67 per cent. The average from Jan. 1 to March 31, 1927, was 3.75 per cent over the same period of the previous year.

With regard to bus earnings, it is difficult to make comparisons, according to J. E. Hutcheson, vice-president and general manager. For the six-months period ended Dec. 31, 1925, the gross revenue per bus-mile was 24.63 cents, while for the year ended Dec. 31, 1926, it was 26.46 cents per mile, an increase of 1.83 cents, or 7.42 per cent. The number of buses in operation in 1925 was 26, and in 1927 it was 54. Earnings per revenue passenger in 1925 were 6.90 cents and last year 7.61 cents. Revenue bus-miles operated in 1925 were 287,694, in 1926 they were 1,543,632.

After the experience of two winters of operation it is the opinion of the management that the normal future expansion of the tramway system in outlying territory can be satisfactorily affected by motor buses. Use of motor buses co-ordinating with the tramways furnishes more economical expansion and aids the growth of the city without involving large expenditures for construction of new tram lines.

At Hull, across the Ottawa River from the capital of the Dominion, A. V. Gale, manager of the Hull Electric Company, reports a slight improvement in traffic conditions on the railway. This has been due in part, at least, to the failure of a bus line which had been competing with the railway. A moderate increase is expected in the company's business this year.

RAILWAY BUSINESS GOOD IN PROVINCE OF ONTARIO

The year 1926 showed an increase in passengers carried by the Ottawa Electric Railway amounting to nearly 1,500,000 over those carried in 1925. Thus far during the present year there has been an increase of about 5,000 passengers per day over last year. According to Major F. D. Burpee, vice-president and general manager, after the peak year of 1925 the company experienced a steady decline up to and including the month of February, 1926. Since that date railway traffic has shown a steady upward tendency. General business in Ottawa is good. Retail merchants seem prosperous and the future outlook is favorable. The growth of railway patronage, despite the increase in the number of automobile licenses issued, is most encouraging.

Despite weather conditions that hamper motor vehicle operation, the Montreal Tramways has developed an extensive system of co-ordinated car and bus service

In the small town of Cornwall the street railway reports an increase of $15,780 for 1926 over the 1925 revenue. According to W. L. MacFarlane, manager of the Cornwall Street Railway, Light & Power Company, the largest part of the revenue comes from the movement of freight. This was substantially larger in 1926 than the year before. Other traffic also has increased as shown in the following table:

COMPARATIVE STATEMENT OF EARNINGS

	1925	1926	Increase
Cash fares	$28,162	$31,484	$3,322
Ticket sales	8,888	13,992	5,104
Mail service	1,400	1,600	200
Freight and express	30,905	38,663	7,757
Other revenue	2,753	2,150	603*
Total operating revenue	$72,108	$87,889	$15,780

*Decrease.

For the week ended March 12, 1927, the total earnings were $2,630, as compared with $1,421 for the corresponding week in 1926, an increase of $1,209. Passengers carried numbered 26,070, as compared with 15,931 for the corresponding week a year ago. The figures for this period are considered to be typical of conditions this year.

The directors of the company feel optimistic over railway conditions in Cornwall. Last year a capital expenditure of $20,000 was authorized for various improvements, including the purchase of two additional passenger cars. This year an expenditure of $38,000 has been authorized for three more passenger cars and an addition to the carhouses.

Revenue of the Kingston, Portsmouth & Cataraqui Railway is not so large as it was in 1921, according to H. C. Nichol, general superintendent, but was larger in 1926 than the year before. Passenger revenue for the twelve months ended Dec. 31 last was $51,570, as compared with $51,293 for the preceding twelve months. In his opinion, the large number of privately owned automobiles in the city is responsible for passenger revenue being smaller than it was some years ago.

D. W. Harvey, general manager Toronto Transportation Commission, reports a substantial increase in traffic in the city lines during the past year, and indications are that 1927 will show an improvement over 1926. Operating economies have reduced expenses notwithstanding the increase in the volume of traffic handled. Because the management has had experience with the suburban lines for only a limited time it is difficult to forecast their future accurately. It is the feeling, however, that the position of the recently acquired 97 miles of radial lines will be improved as the result of linking and co-ordinating them with the city system.

At Windsor the railway has had a continued increase in revenue since it was taken over in 1920 by the Hydro-Electric Power Commission. In 1919 the gross revenue of the lines serving Windsor and the other border cities was $355,000. For the year 1926 the gross revenue was $1,031,443. This was an increase of 203.9 per cent compared with the first year of Hydro-Electric operation. During this period operating expenses increased only 177.1 per cent, resulting in a gain of 148 per cent in net revenue. The number of passengers carried has increased from 9,150,000 in 1920 to 18,410,000 in 1926. Revenue for the first four months of the present fiscal year, which began Nov. 1, shows an increase of more than $43,000 over the corresponding period the year before.

At Guelph the railway in 1926 had the largest revenue in its history. The Toronto & York Radial lines showed some decrease in revenue, due partly to the transfer of certain portions of the interurban lines to the jurisdiction of the Toronto Transportation Commission and partly to bus competition. It is expected that the bus competition will be eliminated in the near future.

City lines of the Brantford Municipal Railway in the year 1926 showed considerable improvement over 1925. Passengers carried numbered 2,543,176, as against 2,344,842 the preceding year, an increase of 198,334. Passenger revenue was $129,293, as compared with $119,904, an increase of $9,389. On the interurban lines to Paris there was a slight decrease. Passengers carried were only 104,495 in 1926, as against 109,696 the year before. The loss in revenue amounted to $319.

Increase in the city business is attributed by A. H. Foster, manager, to the fact that the industries in Brantford have been busy of late and there has been little unemployment. While this condition continues the railway may expect good business. The prospects for the interurban line are not particularly bright, in his opinion. Competing buses are to some extent responsible for this, but the widespread ownership of private automobiles is the fundamental difficulty.

At Hamilton the Dominion Power & Transmission Company shows a marked improvement in its street railway business. George E. Waller, manager of railways, is optimistic concerning the future of the city lines, but expresses doubt about interurban lines serving outlying communities.

While there was an increase in railway traffic at Kitchener during 1926 over the previous year, the present outlook is not thought by V. S. McIntyre, manager, to be particularly favorable. To date during 1927 the traffic has been somewhat less than during the corresponding months of 1926.

Although the London Street Railway operated approximately 120,000 more car-miles and bus-miles during the year 1926 than during 1925 the revenue showed a decrease of about $2,000. The same general tendency has continued during the early months of 1927. In the opinion of Leonard Tait, manager, this is largely due to the open winter, the streets in the city of London having been free of snow practically all the time.

Last fall this company began the conversion of two-man cars into one-man, treadle-exit cars. Four cars have already been changed over and the fifth is now under way. It is expected that the reduction in operating expense will to some extent balance the decrease in revenue.

At the Head of the Lakes, electric railway conditions in Port Arthur have shown substantial improvement recently, according to T. W. Brackinreid, manager. Whereas the Port Arthur City Railway had a deficit of $1,160 in 1925, it had a surplus of $5,642 last year. For January and February, 1927, earnings were approximately $4,000 per month above the corresponding period of 1926. March, 1927, was about $3,000 above March, 1926. This increase in revenue is due partly to the heavy snowfall during the past winter, necessitating the storage of private automobiles. The major portion of the increase, however, is due to improvement in industrial conditions. Last summer the railway built an extension to serve the Thunder Bay Pulp Mill. This has been profitable from the day when operations began.

Traffic on the lines of the Toronto Transportation Commission showed a substantial increase last year. At the same time operating expenses were reduced

Success or failure of the street railway at the Head of the Lakes depends entirely upon industrial conditions, Mr. Brackinreid states. In past years revenue sometimes has increased due to the construction of grain elevators, but after the construction was completed the revenue dropped off again. With the growth of the pulp mill business, however, conditions have improved because practically the same number of men are employed in the operation of the mill as were employed during its construction.

Encouraging Conditions in Western Provinces

Since August, 1925, the railway department of the Winnipeg Electric Company has shown steady improvement in gross earnings and the number of passengers carried, according to A. W. McLimont, president. Last year showed an increase of 2,289,000 revenue passengers over those carried in 1925. This was a gain of approximately 5 per cent. Traffic has not yet got back to the peak year of 1925, but will soon reach this figure if the present improvement continues. Figures of passengers carried by years are given in the following table:

Year	Passengers Carried
1921	61,515,000
1922	60,399,000
1923	58,253,000
1924	55,978,000
1925	55,096,000
1926	57,985,000

Railway conditions at Regina, Sask., are very encouraging, according to D. W. Houston, superintendent. Since 1924 the revenue has been increasing steadily. Up to the end of last year it had not quite got back to the high level prior to 1924, but revenue for the first quarter of 1927 was the highest in the history of the railway. The city of Regina is growing and its growth is being reflected in increased street railway traffic.

At Lethbridge, Alberta, railway operation still presents a rather puzzling problem, according to M. Freeman, commissioner of public utilities. On account of the small population of the city and the short distances it is difficult to make street railway operation profitable. In 1926 revenue decreased 2 per cent as compared with the preceding year, but a reduction in operating expenses of 12½ per cent was made, so that the net revenue was substantially increased.

Electric railway conditions at Edmonton are good, according to W. J. Cunningham, superintendent street railway department. The number of privately owned automobiles has increased enormously during recent years, but in spite of this, and the fact that the population of the city has not greatly increased, the number of passengers carried annually remains nearly the same as it was in 1922, the maximum year, as shown below:

1917	...10,086,213	1920	...12,371,091	1924	...12,365,889
1918	... 9,909,529	1921	...12,790,738	1925	...12,588,475
1919	...11,779,466	1922	...12,914,896	1926	...12,388,636
		1923	...12,339,465		

The year 1927 has started out well. For the first four months traffic was well ahead of last year with an increase of more than 300,000 passengers.

For twelve months ended Dec. 31, 1926, the British Columbia Electric Railway carried 61,311,703 city passengers and 6,706,509 interurban passengers. When compared with similar figures for the year ended Dec. 31, 1925, an increase of approximately 4.18 per cent is shown in city travel and 3.41 per cent in interurban.

W. G. Murrin, vice-president, reports that revenue in 1926 from city line operations increased 4.15 per cent over the previous year, while interurban operations showed a decrease of approximately 0.21 per cent.

Car-miles operated in 1925 and 1926 were respectively 11,257,177 and 11,845,149 on the city lines and 1,933,050 and 2,008,872 on the interurban lines. This was an increase of 5.22 per cent on the city lines and 3.92 per cent on the interurban.

BUS DEVELOPMENT PROCEEDING SLOWLY

Operation of buses by electric railways in Canada has not progressed as rapidly as in the United States. This is due in large measure to adverse weather conditions. At St. John, N. B., the railway has not undertaken to render bus service. Careful study has been made of this question, but it is felt that it would be impossible to make money with buses under existing conditions.

The Three Rivers Traction Company is considering the establishment of a bus line and expects to have it in operation within a year. The Montreal & Southern Counties Railway and the Hull Electric Company are both considering the operation of buses. Elsewhere in the Province of Quebec no plans to extend bus operation are reported. Mr. Weyman of Levis says that there is a field for bus transportation to outlying districts during the summer time, but it is impossible to operate buses in this district from November to May. Under the circumstances it is impracticable to undertake the service. The territory served by the Sherbrooke Railway is considered too small to be a promising field for bus operation.

At Montreal there are two classes of bus service, "tram auxiliary bus service" and "convenient bus service." The former, in lieu of tram service, is operated on standard tram fare. On the convenient bus service the fare is 10 cents cash or three tickets for 25 cents. In the first instance the service is given at a loss, but is justified by the fact that the losses are less than on tram operation of the same service. The convenient bus service is given to offer more convenient, direct and comfortable transportation and has been well patronized.

Both the above-mentioned services were inaugurated to retain public good will, and it is thought that its establishment has done more than anything else to convince the public that motor buses will never replace trams for mass transportation. The prospects for the future, for all transportation services, are promising.

In Ontario the bus service of the Ottawa Electric Railway thus far has been conducted at a slight loss. Operations consist of one regular suburban route feeding the city railway, sightseeing routes operated during the months of May to September inclusive and chartered trips throughout the year. It is the belief of the management that the bus can render useful service when co-ordinated with the street railway. On account of the limited experience which the company has had with buses no definite conclusions concerning their future possibilities have yet been reached.

At Cornwall the railway has no intention of undertaking bus service. The distances that people ride in the city are comparatively short and much of the railway revenue is derived from the transportation of factory employees. For this kind of patronage the street cars, with their larger capacity, are thought to meet the requirements better than buses.

The Toronto Transportation Commission now operates a fleet of 80 buses and coaches. Service was first established in 1921, principally to feed the street railway. Six feeder routes are now in operation and two more will be established in the near future. The feeder bus routes serve districts that could otherwise be served by street cars, but where the traffic is so light that the car service would not pay. Losses with bus operation are less than they would be if cars were operated.

In June, 1925, the commission began the operation of motor coaches painted a distinctive color and operated independently of the railway. A special fare is charged. These vehicles are used on interurban routes, for chartered trips, in sightseeing service, on school contracts and for other similar purposes. The gross revenue in 1925 was $132,000; in 1926 it was $300,000, and it is expected that in 1927 it will be well over $500,000. This represents business which could not have been obtained by railway operation and is an important addition to revenue.

At Kitchener the Public Utilities Commission feels that certain sections of the city may deserve better transportation facilities, but that bus service would not pay in those districts. For that reason no plans have been made to establish it. Similarly at Port Arthur bus operation is not favored by the Public Utilities Commission except for long-distance runs to such places as Duluth or other remote points.

Conditions for bus operation at Winnipeg are quite different from those prevailing in the eastern part of Canada. Population is less dense and there are comparatively few outlying towns of any size. Moreover, highway construction has not yet reached the same stage of development as in the East. The management of the Winnipeg Electric Company therefore believes that the field for bus operation there is comparatively small and the company has not gone into interurban bus operation to any large extent. One route is in operation from Winnipeg to Transcona, a round-trip distance of 15 miles. Some extension of this type of service is contemplated for the near future. Buses have been used in local service as feeders to the street railway since April, 1918. Eight such routes are now in operation and it is planned to add to their number in the near future.

Real demand exists today in the territory served by the British Columbia Electric Company for de luxe bus service, particularly for intercity service of this type. It is thought that undeveloped city and suburban districts constitute a good field for experiment with feeder buses connecting existing lines, but the experience of this company indicates that this kind of service is unremunerative on account of the low fares charged. Success or failure of such feeder buses, according to Mr. Murrin, depends entirely upon the density of travel and the rate of fare. This company was one of the pioneers in bus operation and plans to extend this service in the future.

Portage Avenue, Winnipeg, Manitoba. Railway traffic in this city has shown a steady increase since August, 1925

First Aid School Has 335 Graduates

GREATER public safety and a better knowledge of "what to do until the doctor arrives" are purposes of the First Aid training school conducted by the Chicago Rapid Transit Company under the direction of Dr. Hart E. Fisher, head of the medical department, and which graduated nearly 300 student-employees during 1926. The Chicago, North Shore & Milwaukee Railroad simultaneously graduated 35 employee-students. Regularly constituted members of the board of examining physicians of the American Red Cross are in charge of the rigid final tests to which each employee is submitted before he becomes eligible for a First Aid certificate.

In a recent annual interdepartmental First Aid competition held by the employees of the Chicago Rapid Transit Company, which operates the elevated lines in the city and its suburbs, nine teams, composed entirely of employees, entered. Keen rivalry marked the contest and its success is seen in that the winning team averaged 96.5 per cent in two practical problems. Further proof of the proficiency of the employees is shown by the many citations awarded them for meeting emergencies both on and off company properties.

Not only have First Aid educational activities been centered on employees of the Rapid Transit Lines but considerable effort has been expended toward education of the public. During the past year a First Aid team of picked experts gave 184 demonstrations before public gatherings aggregating 87,000 persons. The Rapid Transit Lines also has the distinction of having won the Chicago city championship in First Aid for two of the last three years.

A first aid team to represent the Rapid Transit Company in the annual Chicago city first aid championship contest is chosen from those recently graduated from the school.

St. Louis Building & Loan Association Thrives

THE net earnings from operations of the United Railways Savings & Loan Association, St. Louis, Mo., for the year ended Feb. 28, 1927, were $229,608. As of that date 5,871 members have $3,903,938 to their credit in the association upon the 52,377 shares, or an average of $665 per member. This incorporated building and loan association, with an authorized capital stock of $1,000,000, was organized in January, 1915, to promote home owning and to encourage thrift among the employees of the United Railways. Response to the share offering has been so active that the authorized capital stock has been increased from time to time until it has reached $11,000,000, divided into 55,000 shares, of which 52,377 are outstanding, of a par value of $10,475,400. The association has financed the building or purchase of 2,147 homes since its organization, aggregating loans in the amount of $6,006,096. The number of loans outstanding as of Feb. 28, 1927, was 1,386, aggregating $4,062,586.

A Short Life and a Sorry One for Melbourne's Jitney Buses

Australian Tramway Manager Gives Information on Relative Advantages of Privately Owned and Railway Owned Service

MOTOR BUS legislation in the Province of Victoria, Australia, was summarized in ELECTRIC RAILWAY JOURNAL for Oct. 30, 1926, under the title "Bus Legislation in Victoria, Australia, Proves Effective." The Melbourne & Metropolitan Tramways Board had secured the right to run buses in December, 1923, but success against the forays of wildcat operators did not come until the acts of Dec. 30, 1924, and Dec. 31, 1925, which demanded responsible service and a reasonable amount of taxation from any kind of motor bus operator, whether co-ordinating or independent.

The careers of various independent operators were succinctly stated Dec. 15, 1926, by W. O. Strangward, secretary of the board, before an inquiry of the Parliamentary Accounts Committee. The question was: "Can you give any information concerning the operation of privately owned buses? Can you say whether they are carrying on at a profit after making adequate provision for depreciation?" In reply, he said:

> The Melbourne General Omnibus Company ran for one year, whereupon its buses were seized by creditors who had expectations of possibly 2s. 4d. in the pound sterling, or 11 to 12 cents on the dollar.
>
> The Commonwealth Motors Company's five buses were seized by the creditors after nine months operation, but were already in deplorable condition. Creditors received 3s. 2d. in the pound, or about 16 cents on the dollar.
>
> The Trak Motors Company had 30 buses, of which fourteen were of London General Omnibus design and manufacture. These went back to London when the company failed, while the rest were sold around scrap prices. All the capital investment was lost, aside from losses by unsecured creditors.
>
> The Kintrak Company with nineteen buses lost them all for non-payment of installments. The company lost the whole of its capital. Two sightseeing buses of another company suffered the same fate.
>
> The Grey Motors, after a year's operation, had to quit when the makers seized their seven buses. The whole of the capital was lost. The Blue Line Motor Company, with eight buses, had a like end. The Press Motors lost its equipment to creditors, while the Royal Motors and Forrester Company gave up the business as non-paying.

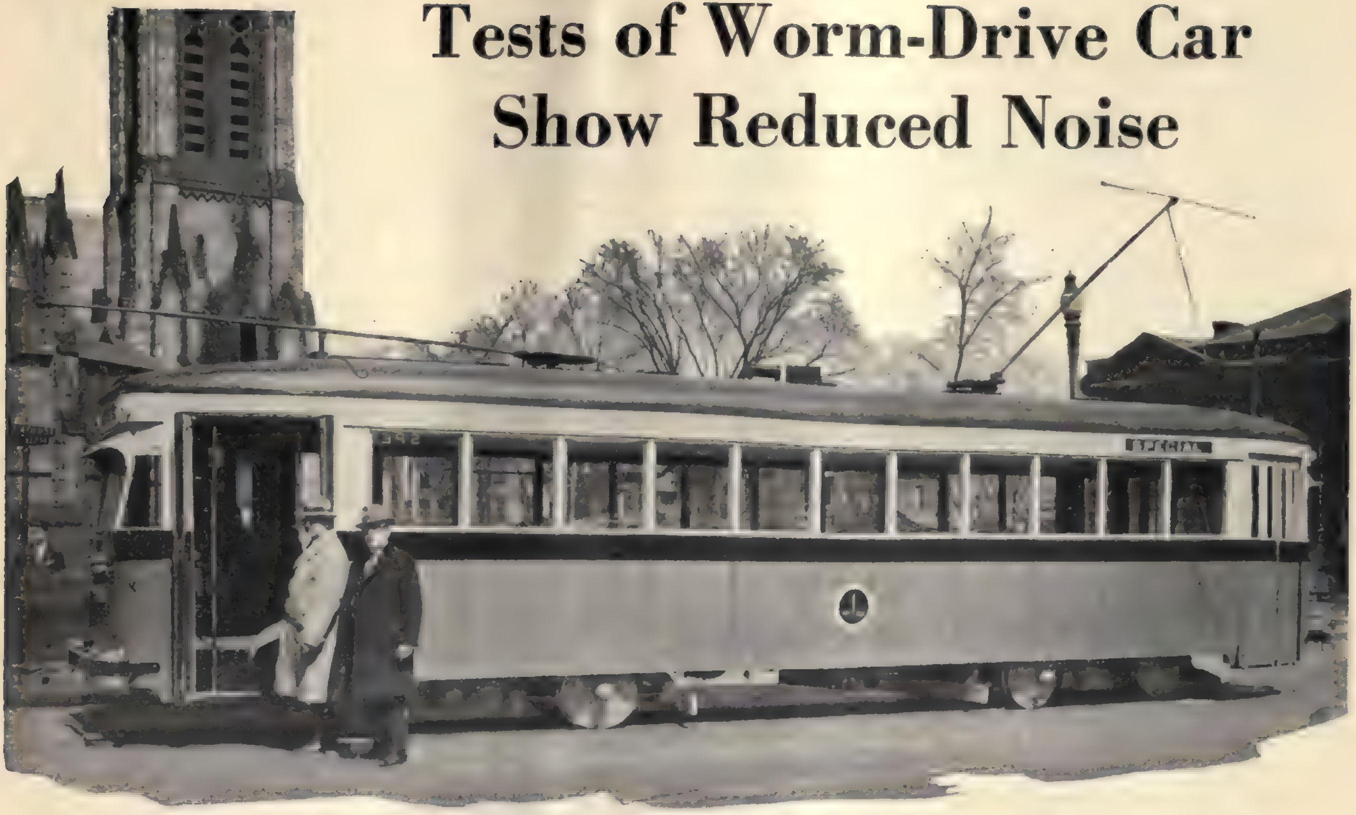
Mr. Strangward estimated that Melbourne bus-selling concerns had lost at least £100,000 between 1924 and 1926 through selling on installments to unsuccessful operators. He figured that at least 80 per cent of the privately owned buses of Melbourne had been bought that way.

In his testimony Mr. Strangward drew up the following deadly parallel between the operations of independents and the board:

Private Enterprise	The Board
Buses usually poor and cheap-starved in maintenance.	Buses up to date and substantially built.
Interest on capital, small.	
No provision for depreciation or renewal.	Twenty per cent allowance for depreciation.
Frequently purchased on time payment.	Heavy interest and sinking fund on cost of bus.
Inadequate garage accommodation.	Adequate upkeep and maintenance.
No attempt to provide an adequate "all day" service.	An adequate, dependable and regular "all day" service is provided.
Owner-drivers "lay off" for meals and at slack hours, spreading their work over two widely separated peaks. They are thus able to pick up the cream of the traffic.	Meal reliefs are provided by additional drivers. Excessive spreads are met by the employment of additional crews.
Cases have been reported of owner-drivers spreading their work over fifteen or sixteen hours a day.	Each man is paid for at least 48 hours per week, although in many cases only 42 hours work can be found for them.
Seeks payable routes only.	The board's buses are run on two "developmental" routes, viz., at Williamstown and from Victoria Bridge to Balwyn Road. A portion of the latter route was exploited by privately owned buses, found unpayable and abandoned. The balance of the board's buses are used to provide a "stop-gap" service while cable tramways are being converted to electric traction. The sides of these "conversion" streets are congested and the surfaces are unfit for bus operation. This causes excessive maintenance and extra fuel consumption and slows down and disorganizes the service.
No concession fares or free traveling.	The board allows school children and others to travel at concession fares and also allows certain free traveling.
Very few restrictions as to working conditions.	Practically in line with tramway operation. For example: Drivers are paid 1½d. (3 cents) per hour extra for driving one-man buses. Time and a quarter on Sundays. Time and a quarter for "spreads." Employees are supplied with uniforms free. Two weeks annual holiday is granted on full pay, also sick pay allowance, etc.
In some cases female conductors are employed at wages much lower than those paid to male conductors.	No female conductors are employed.
Owner-drivers effect their own running repairs.	Board is compelled to employ mechanics to effect all repairs. For example: At Williamstown three shifts of mechanics are maintained to effect repairs to the three buses in operation.
No inspectors or supervisors.	Board requires supervisors.

It is apparent that evolution toward unified service has gone the same course in Australia as in America, but the process has been faster because the officials of the board kept a keen eye on the development of jitney-bus operation in America and Great Britain and therefore were better prepared. It will be recalled that during the summer of 1925 Mr. Strangward visited the United States and Canada to get a first-hand view of transport progress in America.

Tests of Worm-Drive Car Show Reduced Noise



Mayor Parker of Springfield, Mass., and President C. V. Wood of the Springfield Street Railway just before boarding experimental worm-drive car for demonstration run

Initial tests with apparatus developed by noise reduction committee of American Electric Railway Engineering Association show worm-drive car considerably quieter than conventional car. Additional features of brake, safety and door control equipment are outlined

FURTHER data concerning the experimental worm-drive street car built for the Springfield Street Railway, Springfield, Mass., have recently become available. These include the results of noise tests conducted by H. S. Williams, chairman of the noise reduction committee of the American Electric Railway Engineering Association, together with details of the novel control and brake equipment on the car. A general article on the body and truck design was published in the March 26, 1927, issue of ELECTRIC RAILWAY JOURNAL. The noise tests were referred to briefly in a communication from C. V. Wood, president of the railway, published in this paper last week, page 822.

The noise tests were made with measuring apparatus which is in process of being developed by Mr. Williams' committee. Although the measuring apparatus itself is still in rather rough form and does not give quantitative results which permit the effects of various sounds on the human ear to be evaluated, it afforded an approximate means of making a comparison between the sounds set up in the new car and those encountered in one of the conventional type cars in service on the Springfield property. The measuring device makes use of radio tubes for converting the sounds produced into electrical impulses which actuate the pen of a sensitive recording meter.

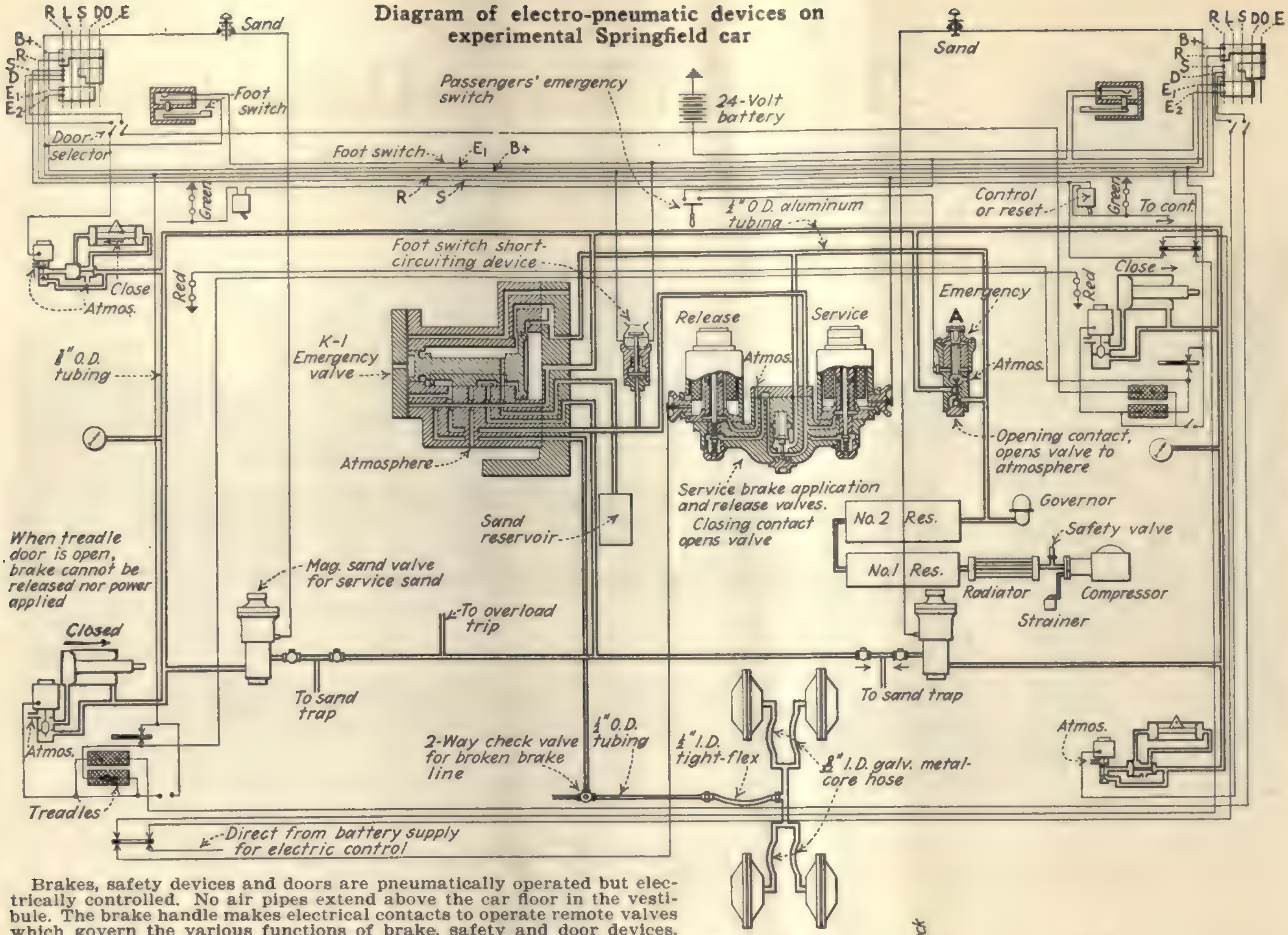
A reproduction of the charts produced on the new car and on one of the standard spur-gear-driven cars on the property, is shown in an accompanying illustration. Although the tests are of only a preliminary nature, the striking contrast obtained is considered by those who conducted the tests to give an indication of what can be expected from further attention in car design to the matter of noise reduction.

In interpreting the results of the tests, Mr. Williams calls attention to several factors which should be taken into consideration. The new car weighed only 25,300 lb., while the conventional car with which it was compared weighed 48,390 lb. Since the noise resulting from impact between wheel and rail was considered to be related to the car weight, it was felt that the new car had an inherent advantage in this respect. In so far as the weight reduction is the result of reduced motor weights made possible by the worm-drive design with complete spring support of the motors, however, the new car is entitled to credit for the improvement.

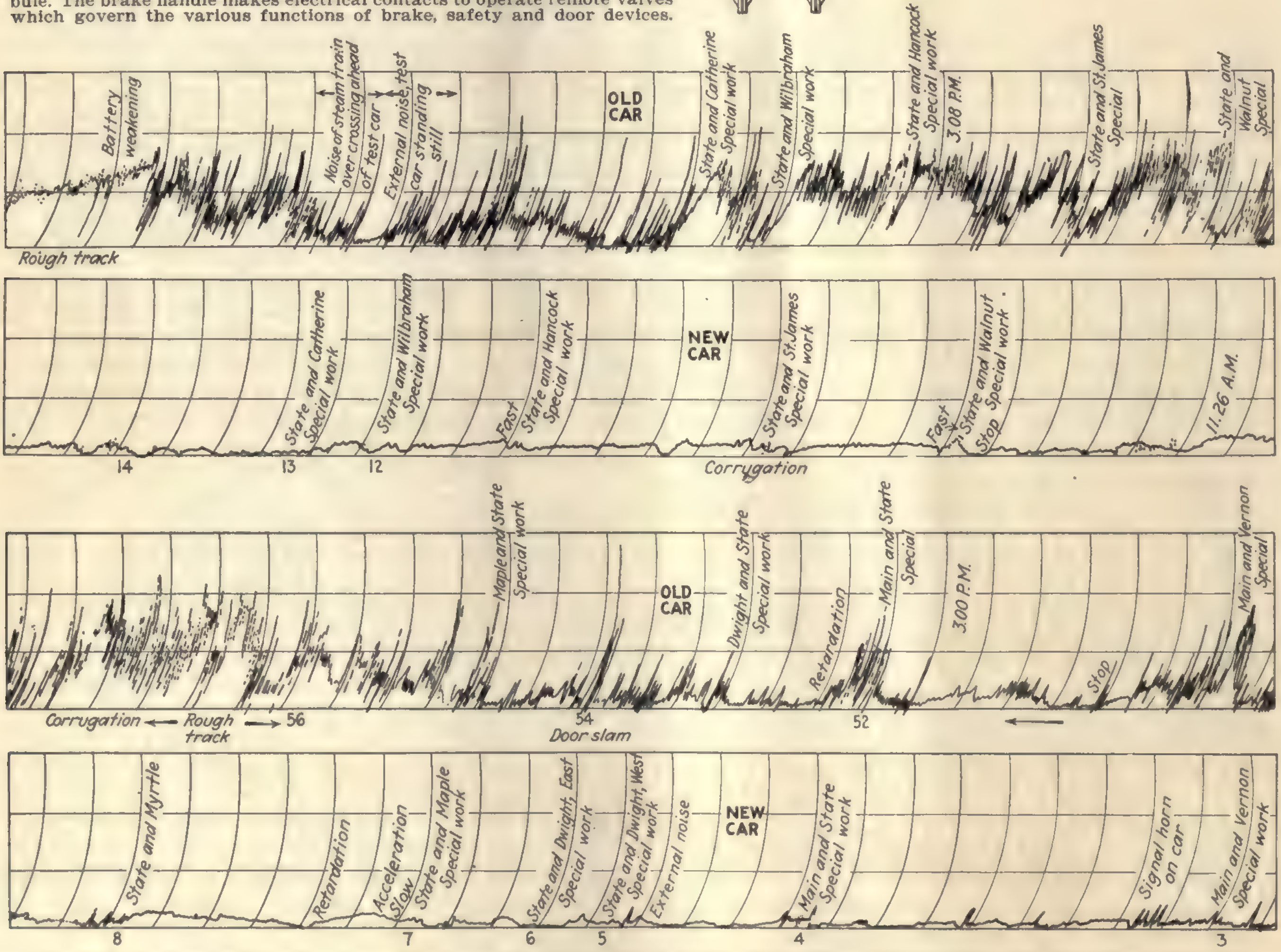
One other factor to be taken into consideration in interpreting the curves is that the experimental car was entirely new, with no wear on the various running gear parts, whereas the conventional car had been in service for a number of years and was not specially prepared for the tests. It was, however, considered to be in first-class operating condition. During the tests the new car was run at slightly lower operating speed than the conventional car.

The comparative noise made by the two cars is shown

Diagram of electro-pneumatic devices on experimental Springfield car


R L S D O E
B+
R
S
D
E1
E2
Sand
Foot switch
Door selector
Passengers' emergency switch
24-Volt battery
Foot switch
E1
B+
R
S
Green
1/4" O.D. aluminum tubing
Control or reset
To cont.
Close
Atmos.
Red
Foot switch short-circuiting device
K-1 Emergency valve
Release
Service
Atmos.
Emergency
A
Atmos.
1/4" O.D. tubing
Atmosphere
Service brake application and release valves. Closing contact opens valve
Opening contact, opens valve to atmosphere
Governor
No. 2 Res.
No. 1 Res.
Safety valve
Radiator
Compressor
Strainer
Sand reservoir
When treadle door is open, brake cannot be released nor power applied
Mag. sand valve for service sand
To overload trip
Closed
To sand trap
To sand trap
Atmos.
Treadles
2-Way check valve for broken brake line
1/4" O.D. tubing
1/4" I.D. tight-flex
3/8" I.D. galv. metal-core hose
Direct from battery supply for electric control

Brakes, safety devices and doors are pneumatically operated but electrically controlled. No air pipes extend above the car floor in the vestibule. The brake handle makes electrical contacts to operate remote valves which govern the various functions of brake, safety and door devices.



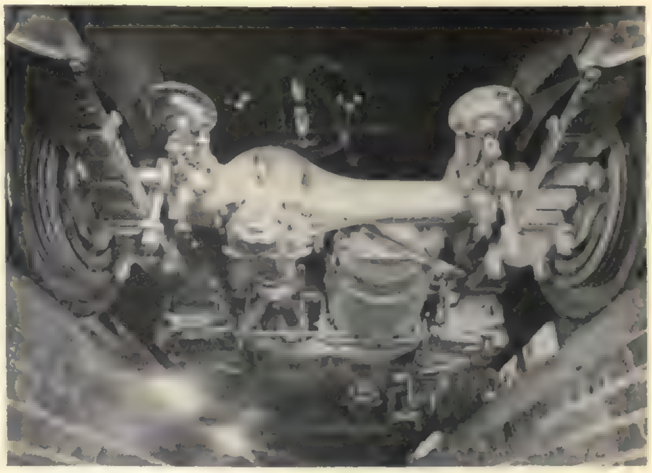
Record obtained with noise-recording apparatus in tests of Springfield, Mass., worm-drive car and older type car. Relative noise produced over identical track is shown by amplitude of instrument deflections

by the charts. They read from right to left, the upper chart being for the old car and the lower chart the results on the new car. Both cars were run over the same track and the various locations and track conditions are shown, so that comparisons of noise can be made for the same track locations. The effects of special work and rail corrugation are strikingly shown. Comparison of the noise values on identical pieces of track may be made by means of the street locations indicated on the charts. The variations in car speeds over these sections for the two tests represent the only definite variable introduced. In the section of track between Maple and Hancock Streets on State Street the effect of the new design in reducing the noise over corrugated track is clearly indicated.

NOVEL FEATURES IN CONTROL AND BRAKES

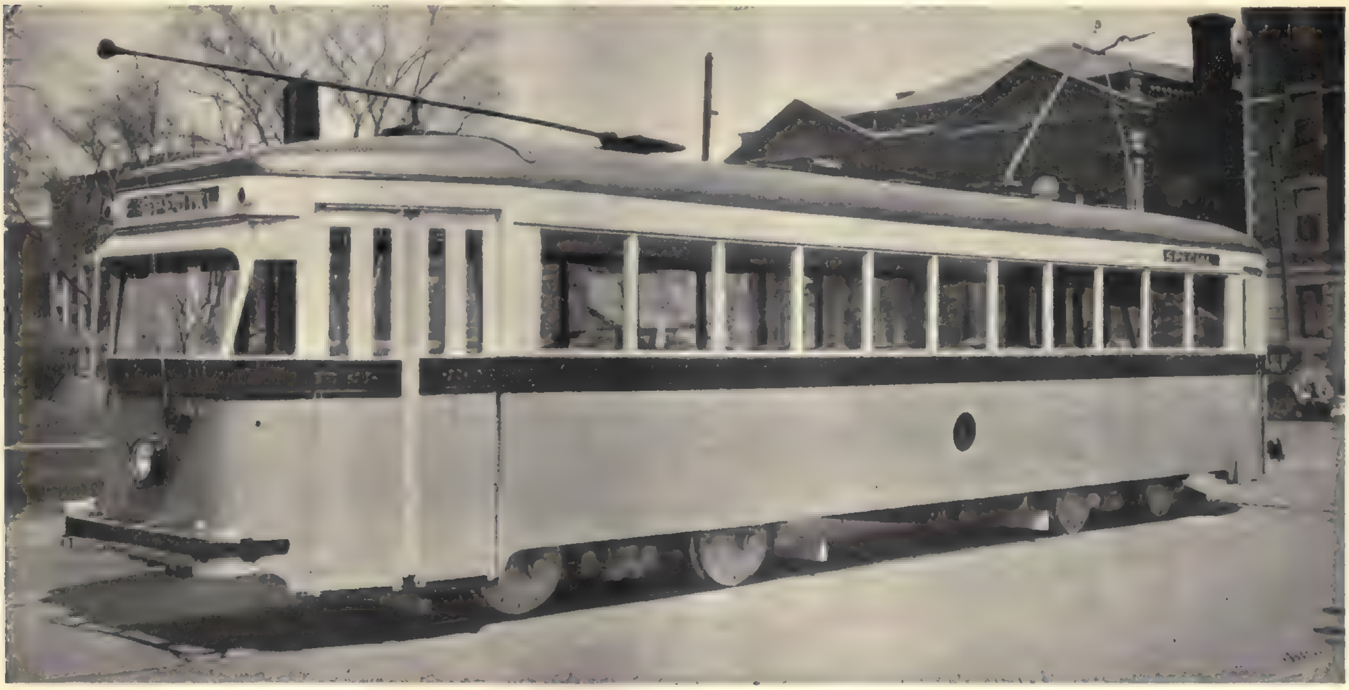
As described in the previous article on this car in the March 26, 1927, issue of ELECTRIC RAILWAY JOURNAL the brakes are automotive type with Westinghouse brake diaphragms mounted directly on the axle housings and with internal expanding shoes inside brake drums bolted to each wheel. Use of a vehicle type master controller with 24-volt battery current control of the contactors mounted under the car is another novel feature of the equipment that was described in the previous article. But even more radical departures from general practice are represented in the brake control, safety features and door control arrangement. All of this is full electro-pneumatic so that no air pipes except that to the air gage are brought above the car floor in the vestibules. One reason given for the adoption of this arrangement was elimination of the air pipes leading to the brake valve at the operator's location.

A piping and wiring diagram for the various air devices, which include full safety car devices and treadle-operated exit doors, is shown in an accompanying illustration. The motorman's brake handle functions merely as a device for completing electrical contacts to the various remotely located electro-pneumatic valves. To apply the brakes in service application, or to release them, the electrically controlled service or release valves, as the case may be, are actuated when contact is made by moving the brake handle to service application or release positions. Operation of the service valve admits air from the reservoir line to the brake diaphragms, while the release valve, when its contact is made, exhausts brake pipe air to atmosphere just as is done in a conventional brake installation. These electrically controlled valves merely perform the functions of the service application and release ports in the customary brake valve.



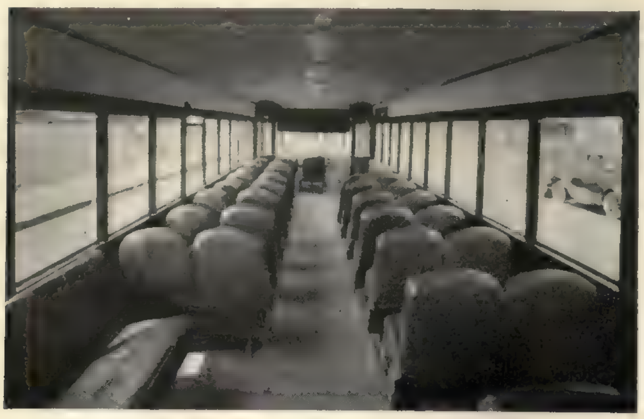
A view looking up under the Springfield car. The motor and driving gear arrangement are clearly shown together with the mounting of springs and brake rigging

A K-1 type emergency valve is included in the equipment. It functions to dump reservoir air directly into the brake diaphragms to give emergency application of brakes, balance door engines, sand rail and trip off power, when the electrically controlled valve *A* in the diaphragm is opened to atmosphere. This emergency action is caused by moving the brake valve control to



Three-quarter view of worm-drive car showing clear vision obtained for operator by automotive type windshield. Sloping glass relieves him from glare of interior lights at night. Streamline appearance is obtained in this design the extreme right-hand position, as is done on the standard safety devices equipment, by release of the motorman's foot switch without having the air brakes set, or by pulling a passenger's emergency switch in the center of the car.

Service application of sand is also electrically controlled through magnetic valves indicated on the diagram. Doors are operated through an electrical contact on the brake handle in a position similar to that on the standard safety devices equipment. The operation is through magnetic valves in the door equipment. Selector switches are arranged conveniently for the operator so that he may open either front or rear door or both, by moving the brake handle to door open position. While the treadle-operated door at the rear of the car remains open to discharge passengers, the brakes cannot be released, nor can power be applied to start the car.



Interior of Springfield car looking forward. Note the absence of top sash, the flat roof and clear view from operator's position

Nashville Railway Betters Accident Record

The Company Finished the Year 1926 with a Record of 73 "Zero Days" on Which There Were No Accidents—Eighty Trainmen Participate in Bonus for Going Through Entire Year Without an Accident

WHEN the Nashville Railway & Light Company operated its cars 66 days without an accident in 1925 it was looked on as something of an accomplishment. Working to better this record, Superintendent H. A. Davis continued the campaign during the past year without relaxation. As a result the transportation department went through the year 1926 with a record of 73 no-accident days.

The 400 trainmen averaged 16,905 car-miles per chargeable accident, against 15,487 in 1925. Considering all accidents, they went 6,852 car-miles for each accident, chargeable or non-chargeable, compared with 6,600 in 1925. The record has been improving year after year ever since 1922, when 1,779 accidents were recorded. In 1923 the number fell to 1,418, in 1924 to 1,205, in 1925 to 840 and in 1926 the record was down to 829.

A striking feature of the year was that there was a decrease in the number of automobiles struck by street cars from 252 in 1925 to 190 in 1926. As an indication that this was not due to safer driving of the automobiles, the accidents in which the latter struck the sides and rear of street cars went up from 272 in 1925 to 286 in 1926.

COMPARATIVE ACCIDENT RECORD OF NASHVILLE RAILWAY & LIGHT COMPANY FOR 1926 BY CAR LINES AND BY DIVISIONS

Car Lines	Total Accidents	Car-Miles per Total Accidents	Chargeable Accidents	Car-Miles per Chargeable Accidents
Belmont	62	6,310	24	16,300
Radnor	50	10,882	17	32,005
Cedar St.	22	4,965	6	18,207
St. Cecilia	10	9,986	7	14,266
West Nash	77	9,323	30	23,928
Woodland	62	8,578	19	27,990
Wharf Ave.	15	5,509	6	13,772
Fairfield	55	5,112	30	9,372
Shelby	21	12,038	8	31,601
Meridian	39	6,345	15	16,496
Glendale	76	6,670	29	17,481
Cal.-McFerrin	10	6,234	4	15,584
Kayne Ave.	21	4,846	11	9,252
Jo Johnston	22	4,553	11	9,106
Jefferson	54	4,300	20	11,560
Hillsboro	78	4,710	44	8,351
Buena Vista	39	6,572	13	19,716
Broadway	87	6,783	32	18,445
South High	5	8,036	3	13,393
First St.	24	5,054	7	17,328
Owls	0	42,636	0	42,636
Divisions				
South	125	7,584	56	16,929
West	98	8,439	36	22,974
East	156	7,793	53	22,938
So. West	324	6,042	140	13,982
North	125	5,507	51	13,498

Of the 400 men, 80 motormen and operators went through the entire year without a chargeable accident. For this record they will share in a bonus of $1,000 donated by the company.

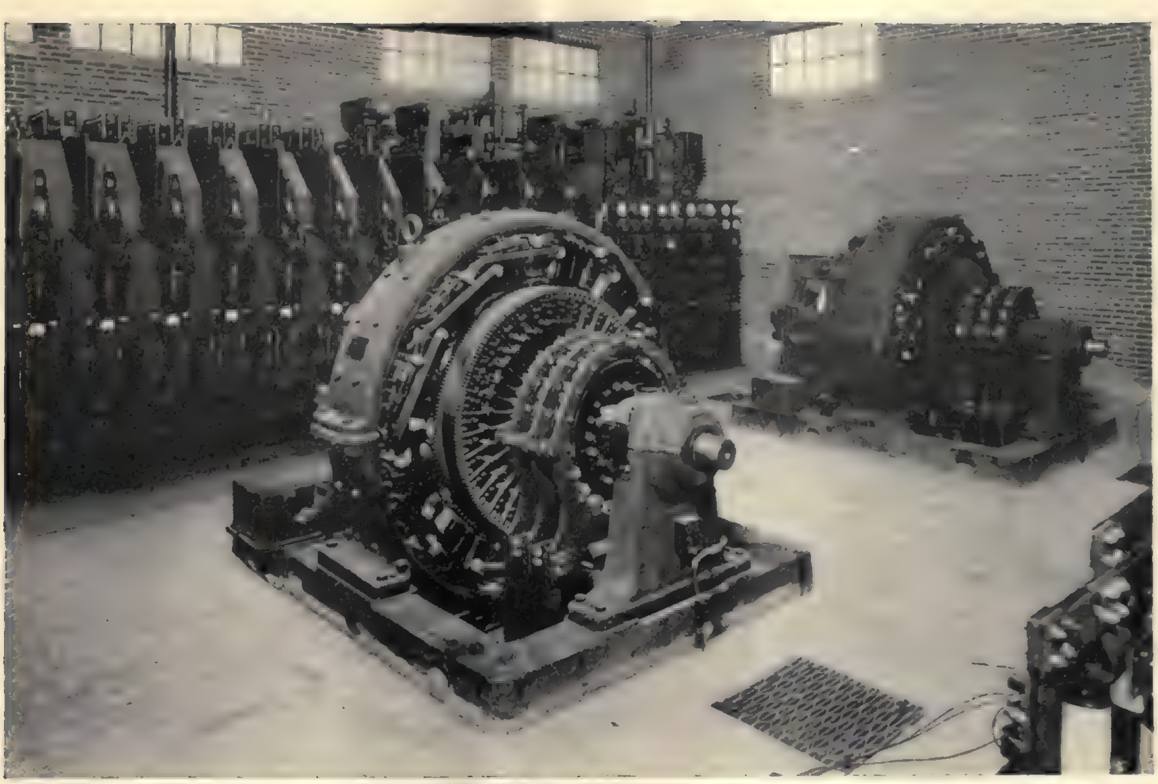
The spirit of competition which has been a feature of past years in Nashville was continued, and this was probably the primary cause of the excellent record. Two types of comparison are made, one for the various car lines, the other for the five operating divisions. Each month the computation is made of the total number of accidents, car-miles operated and car-miles per accident. The same is done for chargeable accidents. The accompanying table shows the final record for the year for each of the car lines and for the divisions. The best record for all accidents was that of the Shelby line, which ran 12,038 car-miles per accident. Counting only the chargeable accidents, the Radnor line went 32,005 miles for each one reported. It is interesting to note that the owl cars ran the entire year without having a single accident of any character.

Details of the methods used for accident prevention were published in this paper Oct. 31, 1925, page 784.

Market Street Railway Advertises City and Railway Growth

THE Market Street Railway is a believer in consistent advertising in San Francisco, where it furnishes three-fourths of the electric railway service. The March issue of *Byllesby Monthly News* states that in one of its recent advertisements, under the heading "It's Interesting to Know," many pertinent facts were recorded. Among these were the following:

> That San Francisco has consistently increased in population at the rate of about 30,000 annually for the past ten years.
>
> That in this city there are 2,198 industries.
>
> That there are 1,600 hotels here.
>
> That San Francisco has 44 public parks and 27 playgrounds for children.
>
> That this company built 28 new street cars in San Francisco shops in 1926 and manufactured in those same shops almost all the vast amount of maintenance material required for its 700 cars and 295 miles of street car lines.



All automatic control panels in the Grimm Avenue substation are located on the right end of the switchboard

New Automatic Substation

for the Chicago Surface Lines

Supervisory control has important part in scheme of operation. No load shifting resistors are used. Comprehensive system of natural ventilation

By B. G. Noah

Engineer of Tests Chicago Surface Lines, Chicago, Ill.

RECENTLY the first automatic railway substation to be used in Chicago was put in operation by the Chicago Surface Lines. It is designated the Grimm Avenue substation and is located near the intersection of Milwaukee and Lawrence Avenues in the northwest section of the city. It contains two 2,000-kw., 600-volt, 60-cycle synchronous converters, which provide sufficient capacity to take care of the present load with some reserve for future extensions. At present six sections are fed from this substation, three being ties with the Crawford Avenue substation and three stub-end feeders.

Grimm Avenue substation is supplied by two 12,000-volt, 60-cycle underground lines. These lines terminate in a high-tension switching compartment located inside the building and are connected to a common bus through line oil circuit breakers. The primaries of each bank of transformers are connected to this bus through an oil circuit breaker and a short section of underground cable. This cable terminates in the transformer compartment at the rear of the building. The transformers are of the single-phase, oil-insulated, self-cooled, outdoor type. Their secondaries are connected to the respective converters through starting and running oil switches. The interconnections between transformers, secondary switches and converters are made with 1,500,000-circ.mil lead-covered cable which is run in fiber conduit.

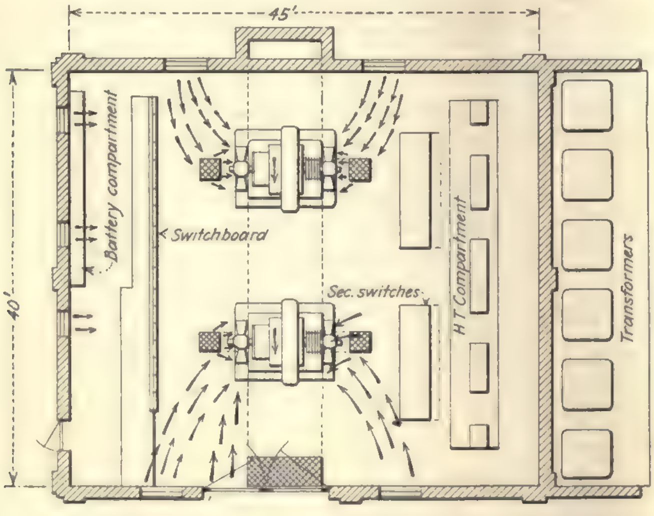
The synchronous converters are six-phase, compound-wound, commutating-pole machines. They have 100 per cent shunt field windings and are operated with the series field winding short circuited. The direct-current

Transformer compartment at rear of building

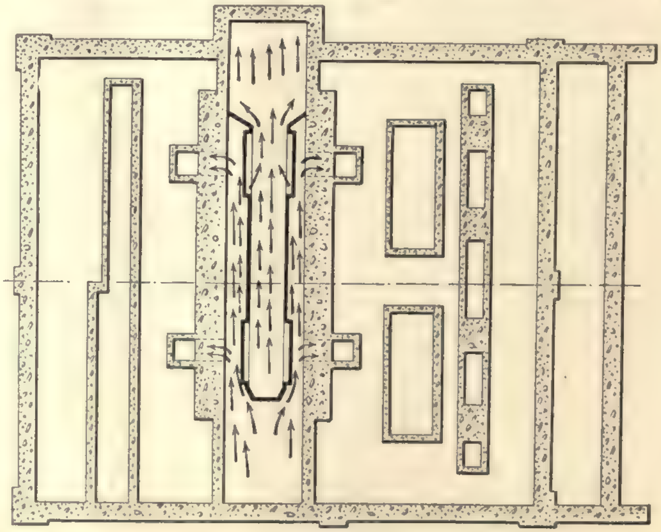
voltage of the machines drops 5 per cent between no load and full load when operated in this way. The necessary equalizer contactors and connections are installed so that the machines may be operated as compound units in the event that a constant or rising d.c. bus voltage is desired.

As is common practice the leading machine is started automatically with a sustained low direct-current bus voltage, and the second machine is in turn started on sustained overload on the first. The machines are shut down in the reverse order due to sustained underload. Either can function as the leading machine, the order being governed by the position of a manually operated sequence switch. All of the protective features of the modern automatic substation are included. Each machine is protected from severe short circuits on the direct-current side by two parallel-connected high-speed circuit breakers in its positive lead. These breakers are paralleled by grid resistors. When a short circuit occurs these breakers will open and introduce the grid resistors into the circuit, limiting the load on the machine to its commutating capacity. Opening of the high-speed breakers is followed immediately by the opening of a 6,000-amp. carbon circuit breaker which is also connected in the machine positive lead. This entirely disconnects the machine from the direct-current bus. The circuit breaker on the grounded feeder will also open, after which the high-speed breakers will reclose. The carbon circuit breaker will then reclose under the supervision of a voltage balance relay. The circuit breaker on the grounded feeder will not reclose, however, until the ground is removed. These feeder circuit breakers are of the short-circuit detector, service restoring type and have a rating of 3,000 amp. An auxiliary direct-current bus is connected to the main bus through an auxiliary feeder breaker. With this arrangement any section may be fed through the auxiliary circuit breaker when it is desired to make tests or repairs on any one of the regular feeder equipments. The scheme of operation differs from that of the usual automatic substation in one respect, i.e., no load shifting resistors are used. Two factors are involved in making this method of operation possible: First, the low effective resistance between this and the Crawford Avenue substation to which it is tied, and second, the inherent voltage characteristics of the machines in this substation and those in Crawford Avenue. As mentioned before, the machines at Grimm Avenue have a drooping voltage characteristic, whereas the two 4,000-kw., 25-cycle synchronous converters in the manually operated Crawford Avenue substation have a 1 per cent rise in direct-current voltage between no load and full load. In times of abnormal load demand, due to resumption of service after a street blockade, etc., the voltage on the Grimm Avenue substation will be reduced automatically and a portion of the overload will be shifted to the Crawford Avenue substation through the low resistance tie sections.

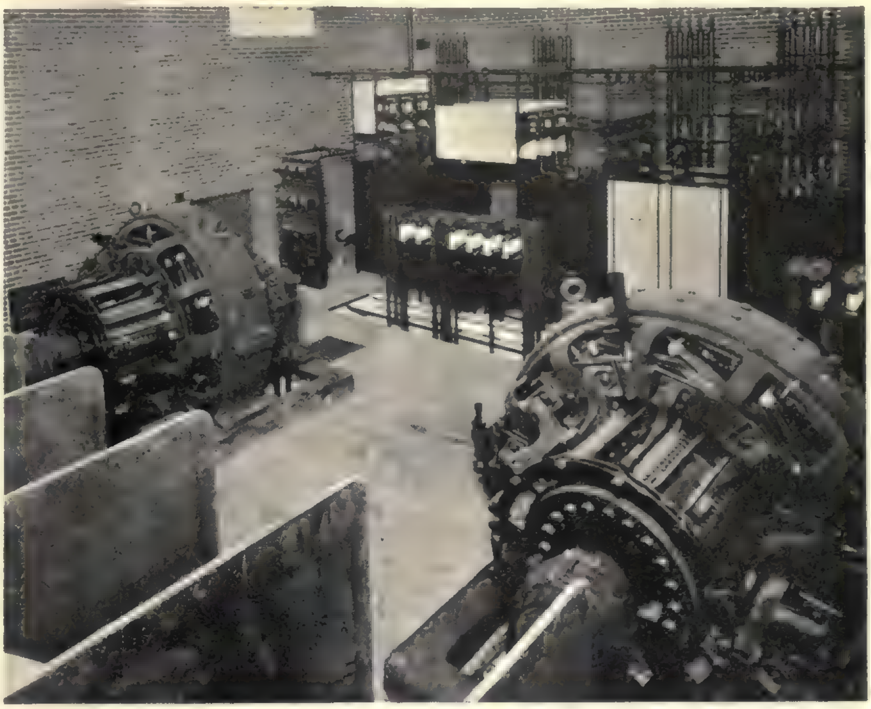
In addition to the above described automatic features,



Floor plan of substation. Air is drawn in through four louvers in the side walls



The pit under machines is separated into two compartments by a steel partition



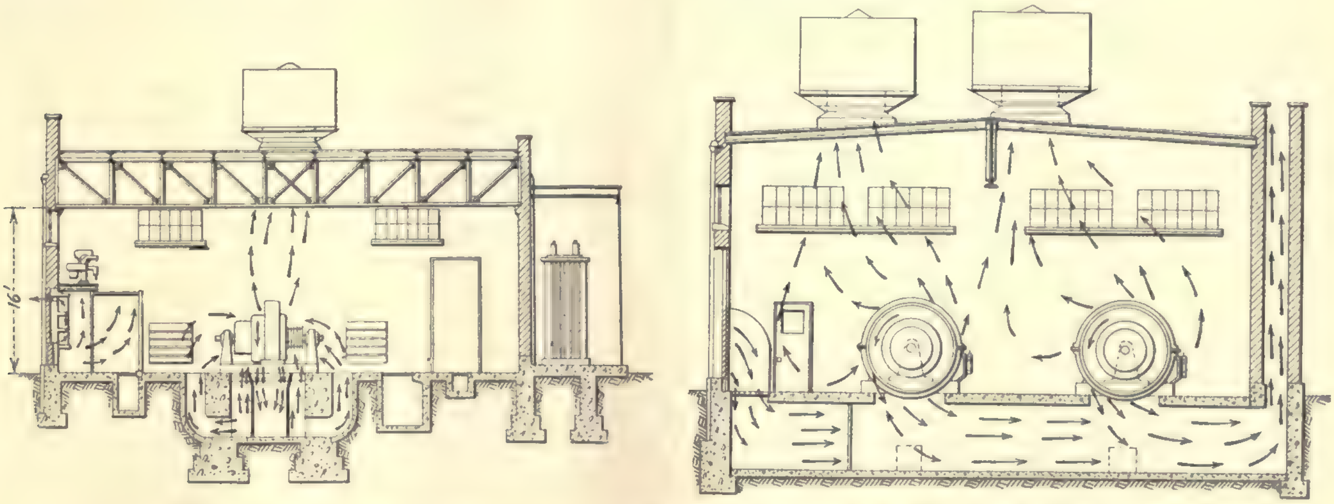
High-tension switching compartment of the Grimm Avenue substation

this substation is equipped with a synchronous visual supervisory control system. The office or control end of this system is located in the Crawford Avenue substation, the operator of which has complete control of the equipment at Grimm Avenue. He can start up, shut down or lock out either or both machines and at all times has a visual indication of the load on each. He has indication when a machine is operating but not connected to the line due to extremely low direct-current bus voltage. He is able to open and close all feeder circuit breakers, has visual indication of the position of the oil circuit breakers on the alternating-current incoming lines, and of the conditions of the operating battery.

In effect, the supervisory control system makes Grimm Avenue substation a part of the Crawford Avenue substation. The major portion of the Grimm Avenue load is common to both and the equipment in both is under the control of one man. This arrangement is of particular value in case of an outage at Crawford Avenue or a general outage of the entire system. In such an event the load on Grimm Avenue can be held to the capacity of the machines by switching on the feeder section at either Grimm Avenue or Crawford Avenue substations. For example, if Crawford Avenue has an outage the operator will open the Grimm Avenue tie feeder at Crawford Avenue. This operation makes all Grimm Avenue section stub-end feeders. If this overloads the machines at Grimm Avenue, he can disconnect the least important feeders from that substation bus until Crawford Avenue is again in service or the load on Grimm Avenue is reduced enough to allow the closing of the feeders.

If the outage at the Crawford Avenue substation occurs while Grimm Avenue is out of service due to low load demand the bus voltage at Grimm Avenue will be excessively reduced. The leading machine will then start. The action of the voltage balance relay, however, will prevent its direct-current circuit breaker from closing if the bus voltage is so reduced that the machine would pick up sufficient load to trip it out again. This condition is indicated at Crawford Avenue through the supervisory control. The operator will then reduce the value of the connected load at Grimm Avenue by opening the three tie feeder breakers at that substation.

It is obvious that this operation will reduce the Grimm Avenue bus voltage to zero. However, the three tie feeder circuit breakers are interlocked with the voltage balance relay through the supervisory interposing relays and will allow the leading machine circuit breaker to close and carry the load on the remaining three stub-end feeders. The operator can then increase the load on the station by closing one of the tie feeders. This increase in load will bring the second machine into service and the remaining tie feeders can then be closed. These tie feeders must be opened at the Crawford Avenue end during this switching operation if that substation is still out of service. In this way the machines at Grimm Avenue can be used to their full capacity during abnormal times without reducing the voltage on the sections it is feeding.



These cross-sectional views indicate the methods used in the natural ventilation system

The supervisory control also becomes invaluable in the event of fire or other accidents when the hazard of live trolley wires must be removed as quickly as possible. This emergency arises quite frequently on a metropolitan system and it is merely necessary to call the Crawford Avenue operator by telephone and he in turn can open the feeder in question at the Grimm Avenue substation through the supervisory control.

The substation building is 40 ft. wide, 45 ft. long and 21 ft. high. Its volume per installed kilowatt is 9.835 cu.ft. The accompanying illustrations show the arrangement of the equipment.

NATURAL VENTILATION IS USED

The scheme of natural ventilation is illustrated in the four accompanying sketches. The arrows on one sketch indicate the direction of air as it is drawn into the building through the four louvers in the side walls. These louvers are 4 ft. square. The direction of the warm air as it is exhausted from the periphery of the armatures is also indicated. The upper portion of this air is discharged from the building through two 54-in. roof ventilators, and that exhausted below is conducted out of the building through the stack shown on the right side of the sketch. Other sketches show the arrangement of the pit under the machines. This pit is separated into two compartments by a steel partition. The sides of this partition are in the neutral air zone between the pressure and vacuum areas. The warm air is discharged from the lower part of the machines into the center compartment, from which it is exhausted through the stack. The cool air, which enters the outer section of the pit through the louvers and floor grating, is drawn into the machines parallel to the axis of the shafts through the floor ventilators. A portion of this air is also drawn into the machines through the upper openings of these outer sections. This arrangement provides free circulation for the incoming air and reduces recirculation of the warm air discharged from the machines to a minimum.

Evansville Company Names Cars After First Settlers

TWO of the four new cars which were ordered recently for use on the Evansville and Princeton, Ind., traction lines have recently been put in service by the Southern Indiana Gas & Electric Company, Evansville, Ind. The cars, of the one-man type, are named after prominent men who figured in the history of Gibson County, in which the city of Princeton is located. The "John Stevens" is named for the first settler of Gibson County, who settled there early in 1789, after serving a period of service in the Revolutionary War. The "William Prince" bears the name of the man for whom the city of Princeton was named. Still another car, styled "Aaron Le Grange," is in honor of the first settler in the town of Fort Branch, which formerly was called Le Grange, and the fourth car, "Henry Haub," is in remembrance of the first man who settled in the town of Haubstadt, which is one of the important stops on the Evansville and Princeton traction line. The new cars are to replace the oldest in service, used on the line since its opening in 1903. The company also has purchased several new one-man cars for operation on the Bellemeade line in the city. According to recent announcements, the purchase of several new buses during the coming year is planned.

California Motor Transport Shows Declining Profits

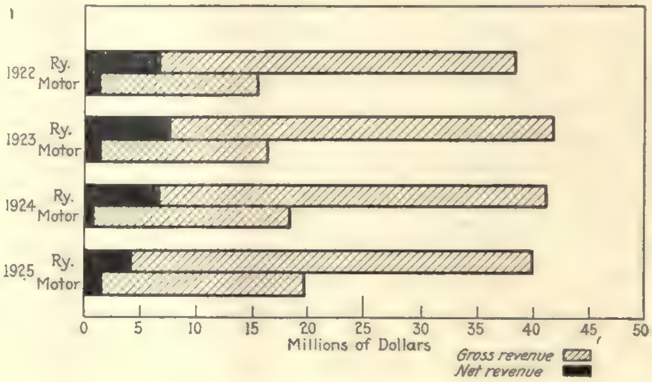
Railroad Commission Reports Reveal Low and Decreasing Profits—Similarity to History of Electric Railway Industry Shown by Comparison

BY GEORGE K. MCCABE
Department of Economics, Sociology and Government, Yale University, New Haven, Conn.

IS MOTOR bus and truck operation profitable? This question is uppermost in the minds of all students of transportation today, and in an attempt to analyze this question a study was made of the common carrier motor bus industry in California. This state was selected as being the most favorable to this class of transportation.

Six conclusions are drawn from a perusal of figures supplied by the California Railroad Commission. First, the motor transport industry in that state considered as a whole has a very high operating ratio with a consequent low net income. Second, the increase in volume of business has been slow, especially that resulting from passenger traffic. A third conclusion is that the loss of passenger business of the electric railways cannot be attributed to motor bus competition.

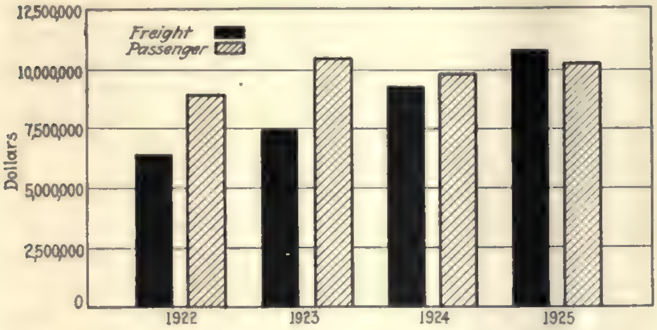
If the rate of depreciation and maintenance charged in 1922 had been maintained in 1925, the rate of return on the bus and truck industry of California would have been less than 1 per cent. This would have been even less than the 2⅛ per cent return for the principal electric railways of that state in 1925, based on the investment in plant and equipment. Other findings indicated that the declining profits in motor bus operation may be due to the partial payment plan of purchasing new equipment and unreal profits which may actually be accrued depreciation.



Comparative electric railway and motor transport earnings in California, 1922-1925

Electric railway revenues for 1925, on the other hand, were higher than in 1922 although lower than in 1923-1924. This points to the inability of electric carriers to increase freight and express business as the motor carriers have done.

The study of the motor transport revenues from 1922 to 1925 inclusive shows that the combined receipts from passengers, freight, express and mail net the owners a return of about 7½ per cent on the $19,000,000 of investment in the industry. This return is after deducting a depreciation charge of 12½ per cent, which assumes a vehicle life of eight years. For a new and flourishing



Passenger and freight receipts of motor transport industry in California, 1922-1925

Data supplied by Railroad Commission of California. Revenue includes freight, express, mail, baggage and other goods traffic.

industry 7½ per cent would seem to be a low return. This rate of return on the investment is especially ominous in that it has fallen from 10½ per cent in 1922 to 7½ per cent in 1925. This is not due to increases in the allowance for depreciation. On the contrary, this has been reduced from 13½ per cent of the investment in the early years to 12¼ per cent since 1922. So, too, have the maintenance and repairs fallen from 23 per cent of the investment to 16½ per cent. Had the operators kept these charges as high as they were in 1922 the profits would have returned less than one-half of 1 per cent on the investment in 1926.

It should be remembered that the gloomy conclusion that the industry may be living on its capital is true only of the industry taken as a whole for the state. Individual operators favorably situated may be earning a high rate of return on their investment after deducting adequate allowances for depreciation and maintenance.

Turning to the first chart, it is apparent that the 50 per cent increase in gross revenue since 1922 has been more than offset by increased expenses. The operating ratio, based on the expenses, including depreciation, maintenance and taxes, has fluctuated between 92 per cent and 96 per cent. In 1925 the operating ratio was 93½ per cent. The only expenses that have risen out of proportion to the increase in receipts have been "taxes and licenses" and "salaries and office expenses." Taxes were twice as high as in 1922 and office expenses five times the 1922 figure.

The high operating ratio given above is probably due more to the slow increase in receipts rather than to the increased operating expense. The passenger business has risen only 14 per cent in four years, although the freight has increased 72 per cent. The second chart shows the yearly changes in these figures. A comparison of these two rates of increase seems to point to the freight business as the more profitable part of the traffic.

The comparison of the gross receipts of the eight principal electric railways with the gross receipts of the motor industry shows that these railways carry twice as much business as the highway transport industry. The railways considered are: Key System Transit Company; Market Street Railway; Pacific Electric Railway; San Diego Electric Railway; San Francisco, Napa & Calistoga Railway; San Francisco-Sacramento Railroad Company; San Jose Railways; Santa Barbara & Suburban Railways. The data on earnings of these companies are taken from Moody's Rating Book for Public Utilities, 1926. The amount of net income after taxes and depreciation, estimated at 5 per cent of gross receipts (more than company accounts allow), is more than five times the net income of the gasoline competitors. This favorable showing is neutralized by the fact that the electric plant and equipment represent about ten times the investment in the motor transport equipment. Consequently the rate of return on the investment in the electric railways averages about 3¼ per cent, as compared with 7½ per cent in the motor transport industry.

ELECTRIC RAILWAY AND MOTOR TRANSPORT EARNINGS IN CALIFORNIA, 1922-1925

Data Compiled by Railroad Commission of California

	Electric Railway Lines		Motor Transport Lines	
Year	Gross Revenue	Net Revenue	Gross Revenue	Net Revenue
1922	$38,318,000	$6,613,000	$15,547,000	$1,226,000
1923	41,960,000	7,595,000	16,237,000	1,318,000
1924	41,169,000	6,774,000	18,232,000	810,000
1925	40,056,000	4,394,000	19,673,000	1,383,000

Net revenue is residue after payment of operating expenses, taxes and depreciation, but before interest.

Plan Schedule Adjustments Now for Reduced Summer Riding

By L. M. Traiser

Special Traffic Engineer Chicago Surface Lines

On most urban transportation systems summer car riding falls materially below the average of fall and winter months. Greater use of automobiles is a factor in this reduction, but loss in school riding and the growing inclination to spend the summer vacation period in the country are the principal considerations.

In many cities the leading stores and business houses close at noon on Saturdays during July and August, the principal vacation months. This not only reduces the riding in the business district during the afternoon, but it gives the people an opportunity to go out of town and much evening riding is lost. This reduction starts soon after the shops close and is felt the remainder of the day.

On lines serving parks and other centers of recreation Sunday schedule adjustment will mean increased service, but it is necessary that the growing tendency away from Sunday street car riding in summer time be recognized and that schedules be trimmed accordingly, or that the increases for park lines necessary to handle the riding be made on an efficient basis. On park or beach lines summer service may be built in the form of a supplementary schedule to be used in full or in part, when and as needed. This permits service to be operated according to riding demands and the flexibility allows reduced operating costs during bad weather, when special attractions elsewhere reduce riding on these lines, and in the fall when the popularity of parks and beaches is waning.

Adjustments of weekday, Saturday and Sunday schedules to reflect the changed conditions of riding during the vacation months should be made early so that saving in crews and cars may extend over the entire period of reduced riding. To provide a basis for these adjustments the schedule man should be informed on the following features:

1. The lines on which school riding is important, the approximate number of pupils handled and the time at which this riding occurs.

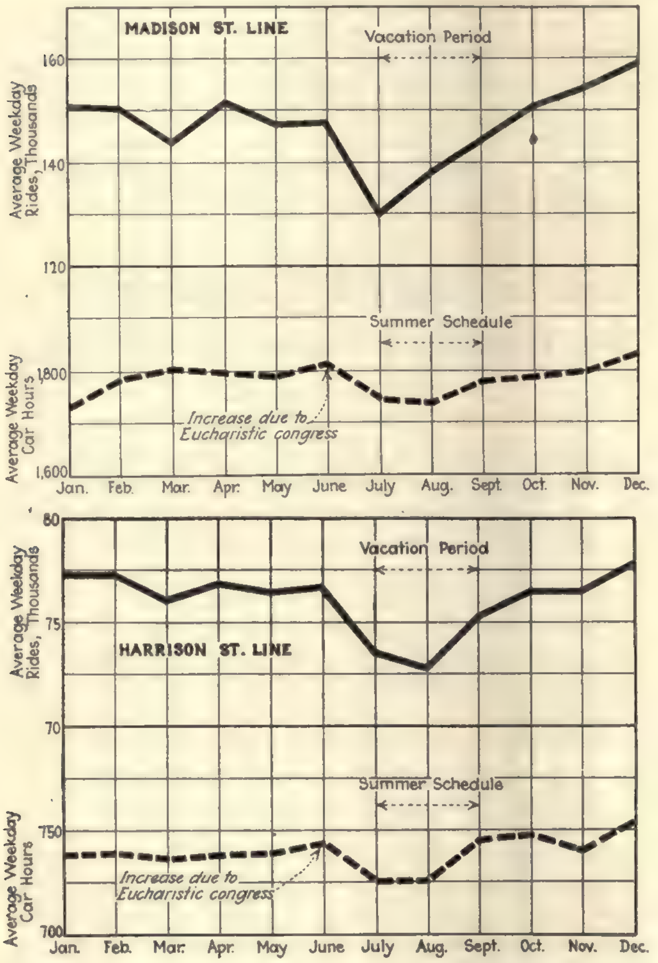
2. The lines carrying during the rush-hour periods a

large proportion of office workers to and from the business district.

3. The probable effect of the vacation period, early closing hours and other factors on Saturday afternoon and Saturday evening riding.

4. The lines on which Sunday riding is materially different during the latter part of June and in July and August.

With this information at hand the schedule man will determine on which lines reduced riding can be translated into schedule changes and then at what periods of the day and on which sections of the line wider headway will function satisfactorily. He will make cuts where it is evident that service will not be needed.



Graphs showing decrease in summer riding and corresponding car-hour reduction in summer schedule on Madison Street and Harrison Street lines in Chicago

The management of the Chicago Surface Lines has met this summer reduction in riding during the past few years with careful adjustments on many of the lines. In 1925 plans were laid for week-day schedule adjustment on fifteen lines involving a reduction of between 35 and 40 runs and a reduction on ten lines after 2 p.m. on Saturdays.

The net result of summer schedule adjustments in 1926 on this property was as follows:

	Change	Cars	Man Runs
Weekday schedules	Decreased	49	61
Saturday schedules	Decreased	18	18
Sunday schedules	Increased	1	6

This represents a considerable saving in labor cost. In addition the reduction in car maintenance, power consumption and the release of cars for overhauling and painting represents a direct economy.

The Readers' Forum

Proposed Fire Protection Regulations Undesirable

NEWARK, N. J., May 6, 1927.

To the Editor:

In the May issue of *Aera* there appears in full the progress report of the National Fire Protection Association committee on garages, together with a review of the considerations which led up to the development of the present draft of proposed regulations. The attention of the street railways is specifically called to certain objectionable clauses which have been retained in the tentative draft now being submitted to the N.F.P.A. In this review particular attention has been drawn to the section on heating and ventilating and to that covering maximum floor areas and size and number of door openings in partition walls between sections.

As the A.E.R.A. representative on the N.F.P.A. committee Mr. Hecker has made a strong effort to secure an acceptable modification of obviously objectionable clauses in these proposed regulations, in some instances with success. In other important instances which vitally affect the railways, however, he has as yet been unable to secure modifications which, so far as opinion expressed to date by a number of railway men indicates, are highly desirable. It has been a case of one representative not having been able to present sufficiently convincing arguments to the balance of the committee to sway them to see these matters in the same light as he sees them, he having been supplied with views of only relatively few of the total number of properties affected.

Mr. Hecker has appealed to the railway engineers and others of the industry interested in the subject to study this report carefully and to see that any comments or criticisms are sent to him promptly so that he may be in a position to present them to the committee. This is a matter the importance of which cannot be emphasized too strongly. It is one that will affect every company building garages through its pocketbook, either in largely increased construction costs or through higher insurance rates, and may also have a serious effect on annual operating costs by reason of reducing the flexibility of use of a given total floor area.

The writer, as chairman of the way and structures committee, has been closely in touch with Mr. Hecker since this subject first came up for consideration and, realizing that only by prompt concerted action on the part of the railway interests can the desired modifications be secured, is taking advantage of the opportunity presented through your columns of emphasizing the importance of the matter to all street railway and bus operators, and in the hope that the appeal may in this way reach some who might not be reached through the other channels.

It is, of course, not expected that a 100 per cent acceptance of our views will be secured in the finally adopted draft of these regulations, as such regulations as these are always a matter of compromise, but no stone should be left unturned in the effort to secure the most acceptable compromise possible under the circumstances. It therefore behooves every street railway operator of buses to see that these regulations are given the most thorough study. HOWARD H. GEORGE,

Chairman Committee on Way and Structures.

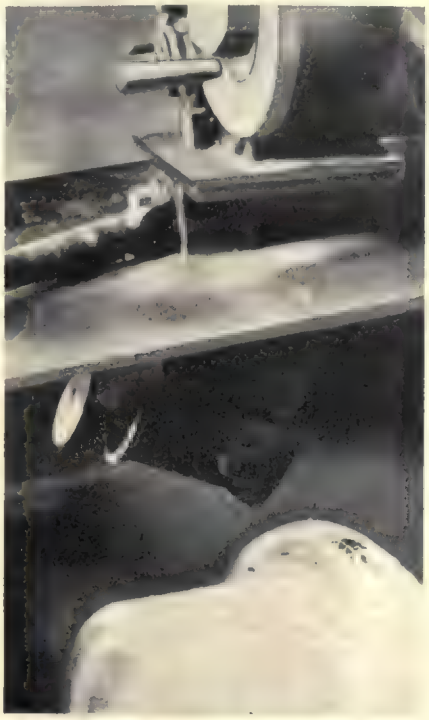
Maintenance Notes

Wheel Flanges Built Up by Welding

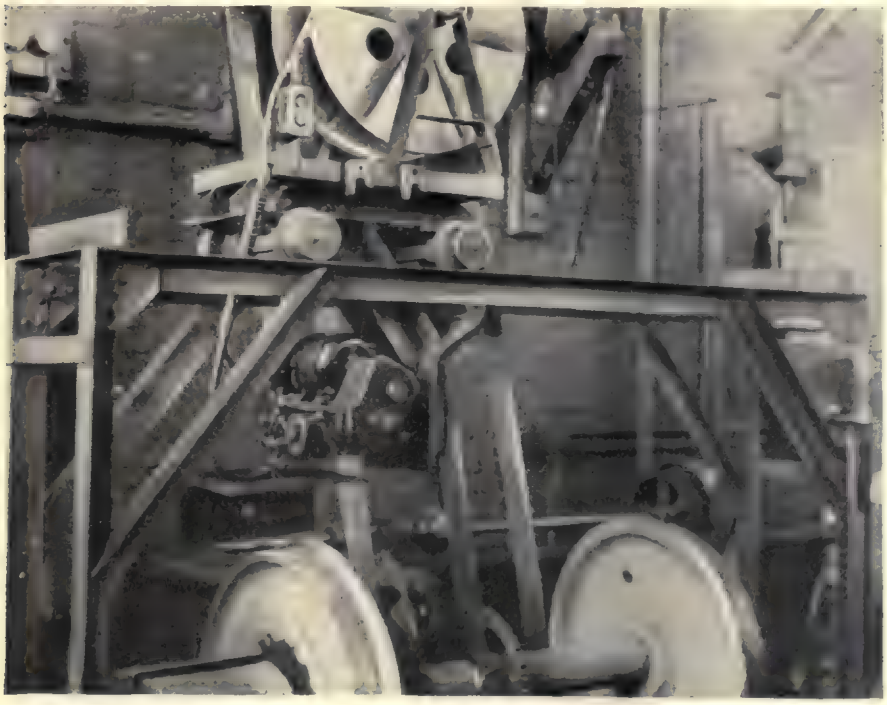
EXTENSIVE use is made by the Los Angeles Railway of automatic electric welding for building up the flanges of steel wheels. The machine used, with the exception of the head, which is a General Electric product, was designed and built in the railway shop. Many features of the machine make it especially suitable for handling this type of work efficiently and economically.

The main frame is built of 2½x3x¼-in. steel angles. The carriage way is about 5 ft. above the floor. Its length is approximately 6 ft. It is braced and gusseted to give it needed strength. The carriage also is built up of the same size angles and supports on top the reel of welding rod and below on a suspended rack the automatic welding head. A switch on top of the carriage is used for turning on and off the welding current.

The wheels and axles are rolled in to the machine over a piece of track. When in the proper position mechanically operated jacks placed under the journal bearings raise the unit off of the floor. These jacks have brass bearings which permit the wheels and axle to turn freely. A split sprocket is clamped on the center of the axle. This serves to revolve the work. The drive to the sprocket is through a quadruple worm reduction from a countershaft at the rear of the machine. A motor is belted to this countershaft. The wheels and axle turn over once in every 7½ minutes, which gives the proper peripheral speed for welding a 30½-in. diameter wheel.



Close-up showing the head and welding point and the wheel set for building up of its flange



Apparatus used in the Los Angeles Railway shop for automatically building up by electric arc welding wheel contour and flanges. The carriage supports the rod supply spool and welding head

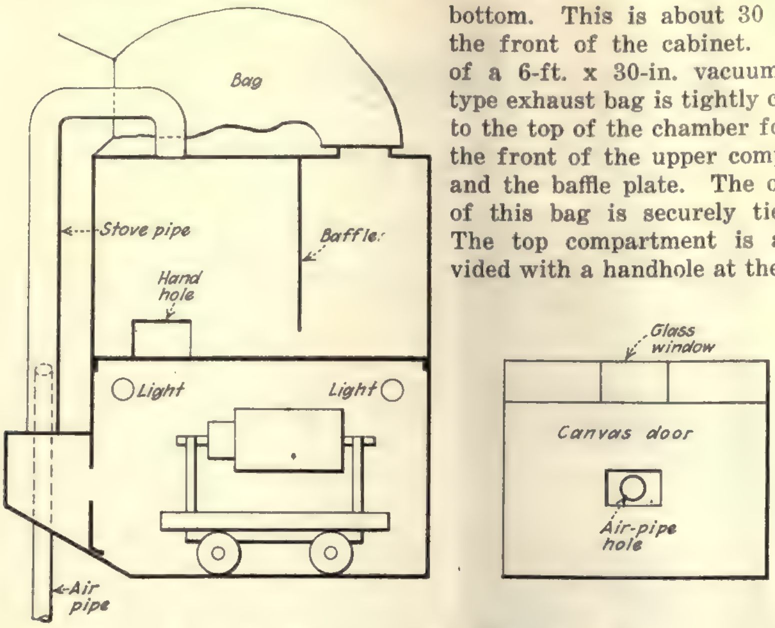
At the rear of the apparatus is another countershaft on which is mounted a wire brush so placed as to clean the wheel being welded. It is driven by the same motor which turns the wheel-driving mechanism.

With the wheels in position, the welding head is lined up with the point on the flange or wheel where welding is to be done, the proper adjustment of the point made, the welding rod feed motor and the wheel driving motor started. Then the device takes care of itself for the complete revolution of the wheel. It takes approximately one hour to build up a wheel flange sufficiently for turning to give the proper contour. The head and spool being mounted on a base which is capable of transverse movement, easy adjustment is possible to cover that portion of the wheel needing building up.

Dust-Absorbing Cabinet for Blowing Out Armatures

WHERE men work under healthy, sanitary conditions, maximum production is assured, since loss of time due to sickness is minimized. With this thought in mind the Interborough Rapid Transit Company of New York developed a cabinet for blowing out armatures and field frames which not only protects the operator from the inhalation of dust but absorbs all dust within itself.

This cabinet is made of 1/16-in. sheet iron and is 6½ ft. long, 5½ ft. wide and 7½ ft. high. A horizontal steel partition divides it into a 3-ft. upper and 4½-ft. lower section. The front of the lower section is fitted with a canvas door containing a glass observation window and a hole for the entrance of the compressed air pipe. In the top of the upper section near the back and in the rear of the lower



A large vacuum cleaner bag above keeps the shop atmosphere clear

A specially designed cabinet in the Interborough shops absorbs the dust during the process of blowing out armatures and field coils

section near the bottom there are exhaust holes, to each of which is attached a 6-in. galvanized stove pipe. A 1-in. air pipe protrudes up into the stove pipe about a foot above the opening of the lower compartment. A vertical steel baffle plate extends down from the top of the upper section, full width, to within 8 in. of the bottom. This is about 30 in. from the front of the cabinet. One end of a 6-ft. x 30-in. vacuum cleaner type exhaust bag is tightly connected to the top of the chamber formed by the front of the upper compartment and the baffle plate. The other end of this bag is securely tied down. The top compartment is also provided with a handhole at the side for the removal of accumulated dust. The lower section is illuminated by four 100-watt lamps.

The armature or field frame is put into the lower section and the canvas door closed. Then the air in the stove pipe is turned on. The part to be cleaned is thoroughly blown out by means of an air pipe inserted through the hole in the door, the results obtained being observed through the glass window.

The direct air stream in the stove pipe, expanding into the upper section of the cabinet, creates sufficient suction effect to draw all of the dust from the lower section up through the stove pipe, depositing it in the upper section. Small particles remaining in the air as it makes its

Attention, Maintenance Men!

THREE CAPITAL PRIZES

***First,* $200 *Second,* $100 *Third,* $50**

TWELVE MONTHLY PRIZES OF $25 EACH

SHORT maintenance articles for ELECTRIC RAILWAY JOURNAL'S maintenance competition are being received. Those published in the Maintenance and Construction issue for May will have the first chance to win one of the prizes. Maintenance men, here is your opportunity! The more items you send in, the more chances you have of winning a capital or monthly prize. Start at once. The JOURNAL will pay $5 for each item published, whether it wins a prize or not.

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 each will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL.

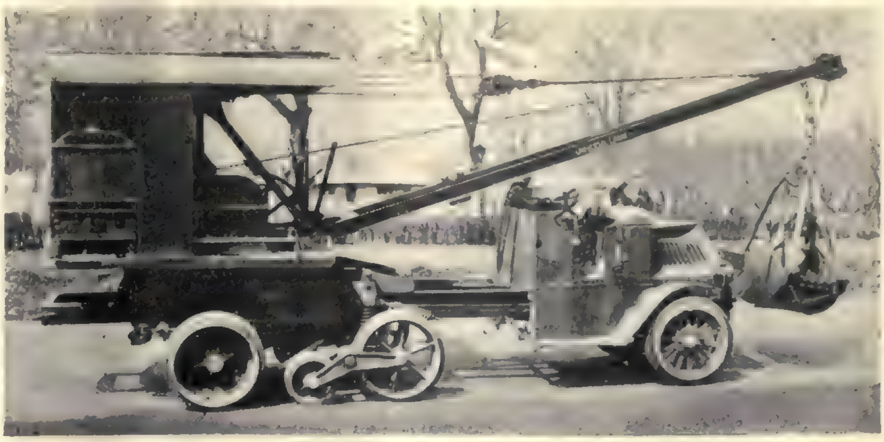
If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

exit through the bag are deflected by the baffle and caught in the bag.

To clean the cabinet, the tied end of the bag is loosened and raised vertically so that the contents will be deposited in the upper chamber. By removal of the handhole cover in the side of the upper section the accumulated deposit can be removed.



Crane equipped as an eight-wheel truck. Its speed is 16 m.p.h.

New Orleans Leads in Mileage Per Pull-In

IN A SHORT article in the April 23 issue of ELECTRIC RAILWAY JOURNAL, page 745, a statement was made that Atlanta is leading the "Southern League" of Street Railway Companies in mileage per pull-in with an average of 26,041. The mileage given per pull-in was substantially correct, but Atlanta is in fourth place instead of in the leading position. In the last report of the Association of Equipment Men, Southern Properties, New Orleans headed the list with 100,833 miles per pull-in, Nashville was second with 45,000, Knoxville third with 32,524 and Atlanta fourth.

New Equipment Available

Removable Crawler Tread for Crane

CONVERTING a rubber-tired truck into one with full crawler rear wheels is the duty of an attachment recently announced by the Universal Crane Company, Cleveland, Ohio. For several years this company has been trying to effect better weight distribution on motor truck cranes, both on pavements and on soft ground. As a result, the eight-wheeled truck was developed, as shown in an accompanying illustration. Even the small wheel shown is a rubber-tired load carrier. Eighty per cent of the load is carried on the rear end and this is distributed equally to the six rear wheels. The box form arrangement of the six rear wheels gives a substantial ground bearing and increases the facility of the unit, which permits handling heavier loads. The unit is capable of a speed of 16 m.p.h.

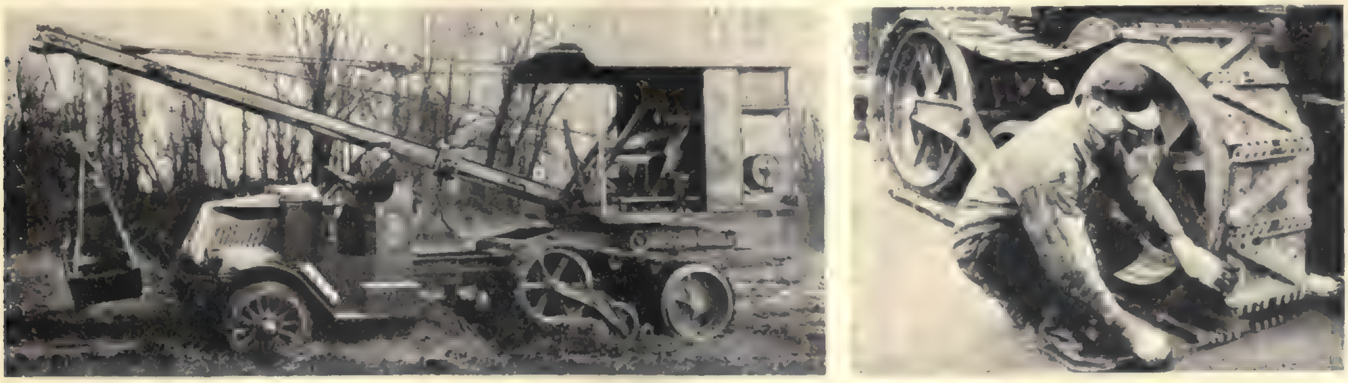
The crawler tread is carried just above the rear wheels, much in the same manner as fenders on an ordinary car. This crawler tread can be attached quickly and can be handled by one man at no extra cost. With the crawler tread in use, the unit has numerous advantages. It eliminates all danger on soft ground work and the necessity for planking. It provides for going directly to the job over banks and depressions. The speed of the unit as a crawler is 6 to 8 m.p.h. over soft ground.

In addition to the soft ground traveling ability of the unit greater over-all width and better distribution of weight are provided. The crawler tread travel is by means of lugs located on each alternate tread which fits between two spacer rollers on the rear driving wheels.

Heavy-Duty Ignition Unit

BUILT to withstand the severe service encountered in bus and truck operation, a new battery ignition unit is being placed on the market by the North East Electric Company, Rochester, N. Y. It is of the closed magnetic circuit type employing the jump spark. Mechanically the unit has been built to provide economical operation under adverse conditions. To this end all parts are made particularly strong and ball bearings are used to eliminate shaft wear.

The ignition coil is ironclad with closed magnetic circuit. It is waterproof, easily accessible and demountable. At high speed the high-tension impulses furnished by the battery ignition unit are reduced slightly in intensity, thus eliminating the rapid burning away of contact points. Contacts are made of tungsten and are protected from burning and arcing by high capacity condensers. Efficient engine performance is attained by automatic regulation at the spark. A supplementary manual control makes it possible to set the spark at the most desirable point under varying speeds and load conditions.



The motor truck crawler will travel from 6 to 8 m.p.h. on soft ground. One man can put the crawler tread on in five minutes

Association News & Discussions

U. S. Chamber of Commerce Frowns on Government Running Business

Private Ownership and Initiative Seen as Key to New and Successful Business Era—There Will Be Need for All Forms of Transportation

IN THE general sessions, committee meetings and section gatherings the keynote of the fifteenth annual meeting of the Chamber of Commerce of the United States at Washington, on May 3-5, was that a new and successful business era was dependent on the government withdrawing from all participation in business. It was the consensus of opinion that private ownership was fully able to operate an American merchant marine, inland waterways and the coal industry, and that by self-regulation American business is bringing about a condition which will result in fewer restrictions being imposed upon private enterprise and initiative through government regulations. Curbing the Mississippi also was given consideration.

TRADE BODIES PROMOTE UNDERSTANDING

Aside from the annual address of John W. O'Leary, president of the chamber, in which he traced the tremendous problems and territory that the chamber covered, also his belief in the slow but sure method of the chamber's referendum as a means of judging future business, the outstanding feature of the first general session, held on May 3, was the address of Haley Fiske, president of the Metropolitan Life Insurance Company, New York. Mr. Fiske's subject was "New Responsibilities of Business," which he divided into the relation of business men to each other, to employees, and to the public. In the first particular the speaker brought out very forcibly what some 60 trade associations were doing to bring about better understanding between business men. Some of the activities, he stated, were as follows: To solve the difficult problem of bringing about improvement in conditions to enable members, especially the weaker ones, to stay in business is what is characterized as "a deplorable competitive situation." To help small manufacturers by giving information they cannot afford to get. To obtain for common use legal opinion on trade difficulties. To put a stop to unfair competition involving graft in obtaining orders. To improve standards in order to meet and overcome cut-throat competition by a series of substitutes. To improve standards and qualities to comply with building ordinances and to strengthen and improve the laws. To establish ethical codes in competition. To send out inspectors to factories to make tests to improve qualities and raise standards. In the Coal Association to promote safety in mining. Co-operating with the Federal Board of Vocational Training to give training courses in localities and by literature to enable merchants to survive competition of chain stores. Co-operation with the Department of Commerce in standardization and eliminating duplication. In regard to the effect of standardization, the speaker said that in one industry $70,000 was saved on one item of the manufacturers, and that another industry had surveyed establishments covering $50,000,000 of business to fix proper ratios of assets, liabilities, income and expenses and had brought about vocational training and furnished help to the small concerns.

COMING MEETINGS

OF

Electric Railway and Allied Associations

May 18-19—**Central Electric Traffic Association, meeting, Tuller Hotel, Detroit, Mich., 9 a.m.**

May 31-June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 9-11—**Midwest Electric Railway Association, annual meeting, St. Louis, Mo.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24—**American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

As an example of how business is improving its relations with the public, Mr. Fiske pointed out that constituent associations are working for the protection of the buying public; that one industry educates the employees to produce good output and has actually got 70,000 of them to sign pledges to give the right kind of work and to replace inferior; many of these are foreign born who are thus trained in American ways. Several of the associations are fighting against misbranding and misstamping; in other words, against deception of the public as to material and quality. Some of them as associations guarantee the quality and evidence it by standard labels. One association certifies an important product where deception would be easy and non-compliance with legal requirement might be concealed. Another association standardizes grades and correctly marks them upon the product. Another enforces standards recognized throughout the world for measurement and inspection. Another association is engaged in eliminating trade abuses and unfair methods of competition. The speaker saw in advertisement also a trend toward better public relations.

EMPLOYEE RELATIONS IMPROVING

In regard to the relations toward employees, Mr. Fiske sees increasing signs of better understanding between employer and employees. "There is much evidence that business men are regarding the human element in labor relationship," continued the speaker. On the other hand, it was pointed out that encouraging signs had their origin in the fact that trade unions are recognizing that peace and prosperity can be promoted by understanding, by co-operation, by recognition of common interests in the industry. The other encouraging signs were personnel administration; co-operation in shop management; suggestion systems with prize awards, not in wages but in promotion of efficiency; improvement of apparatus and conditions under which it is used; medical and surgical attention; dental work; nursing; cafeteria service; milk supply; profit sharing; stock purchased by employees, helped by contributions of employers, mutual benefit associations with corporate assistance, etc. The speaker also gave his opinion of group life insurance, with all its ramifications, which he characterized as "one way to bring home to the employer his responsibility for the welfare of his employees as human beings and the economic quality involved in the brotherhood of man." In this particular Mr. Fiske took occasion to compliment the work of the American Federation of Labor in its recent step of forming a Union Life Insurance Company.

For the new business era, according to Mr. Fiske, both sides are calling for mutual understanding and both are expressing the duty of public service. The true ideal of the business man is to be of service to his country, to his associates in occupation, to the public, to those dependent on him.

Business Forecasts from Various Sections

THE general session on May 4 was given over to forecasts from the East, South, Midwest and West. Speaking for the East, John F. Lawrence of Boston, Mass., stated that pessimism is disappearing in New England. "Many of us feel," he said, "that the problems that New England faces today arise from the fact that New England, to a greater degree than any other section of the country, has reached the stage of industrial majority." Mr. Lawrence then traced the operation of what he described as the business clinic conducted by the New England Council. In his opinion, public knowledge is the best means for a cure. He also stated that the council, in addition to securing the help of educational institutions in the matter of research, was conducting exhaustive surveys through its own research committee. The council, it was stated, has made it popular for New England towns to look within themselves for the means of their advancement and improvement of their economic situation. We are newly awakened to the fresh opportunities before us and to the reward which will likely be ours, the speaker said in conclusion.

SPEAKERS ARE OPTIMISTIC

George H. Baldwin of Jacksonville, Fla., speaking for the South, predicted a bright future for that section of the country because of the availability for the first time of adequate capital and because of the departure from dependency on one product, and of the rapid establishment of new industries. He also saw great encouragement in the fact that there had been practically no labor troubles in that section of the country, attributable to the pure Anglo-Saxon blood of the white population. As far as Florida was concerned, he stated that the rapid deflation of real estate values is being met successfully by the many large and sound banks of the state and by other agencies. The development of the resources of the South, in the opinion of the speaker, is just as dependent as that of other sections of the country on the encouragement which the government gives capital to invest in business enterprise. A curtailment of the demands of those with large incomes for tax-free bonds must be brought about to see these funds again invested in productive enterprise rather than in tax-free bonds.

The agricultural situation in the Midwest was characterized by Silas Strawn, chairman of the board of Montgomery, Ward & Company, as being of unusual gravity, but he described the prosperity prevailing in industrial centers to be unprecedented. As a whole, Mr. Strawn considered the situation as favorable.

Harry Chandler of the Times-Mirror Company, Los Angeles, gave a glowing account of the progress of business in the West. "Forces beyond our power to control or to direct," said Mr. Chandler, "are setting the stage on the shores of the Pacific of a new theater of world events. The century westward march of Aryan achievement has ushered in, what for want of a better term, may be called the Pacific Era. The front door of America will ultimately be on the Pacific, whose eastern and western shores are formed by lands just coming into the world's spotlight in its upward sweep from East to West. In all, while the progress and development of the West has not been without its disappointments and reverses, it has been generally one of steady, consistent fulfillment. We have suffered from few of the spasms of speculative hysteria known as booms, and in consequence we have not had to recover from feeling the resulting sloughs of depression. We have perhaps learned little that the East did not already know and have done nothing that it had not already done. If we have shown any virtue, it is that we have not wasted our time and opportunity in reckless experiments. Our problems line up not so much in what we have done but in what we shall do. We have learned to walk with considerable assurance, but we have no deep-worn paths of tradition to determine the direction we should take. We are dealing with the future, not the past." Mr. Chandler then pointed out that the southern portion of the Pacific seaboard, like every section which experiences an unusually rapid growth of population, has been hard put to balance its census figures with its commensurate rate of industrial growth. Parts of this area, he pointed out, have established new world records for numerical increase and population has been obtained which would be economically impossible of maintenance save for an exceptionally favorable background of natural resources and industrial potentialities.

Group Sections Centers of Interest

VYING in interest with the speakers at the general sessions were those who addressed the group section and who later interpreted the group opinions at the general session on May 5, their topic being "What's Ahead for Business."

"There should be teamwork between agriculture and business," said White B. Heard of Phoenix, Ariz., speaking for the agricultural section. "It is the plain duty of organized business to give assistance in stabilizing agriculture. Farmers are not asking for dough, but equal opportunities and self-interest demand that business men see to this."

"There are 925,000,000 acres devoted to farms," the speaker said, "and 24 per cent of our population derives its living from agriculture." This, it was pointed out, represented an investment of $64,000,000,000. On the other hand, Mr. Heard stated that in 1925-1926 outside capital invested in agriculture represented only 3½ per cent, and that for the same period the average return to the farmer was $648 per annum. Reduction in production is not practical, as the climatic conditions make this impossible; agriculture has not recovered from the depopulation which occurred after the war; the farmer's dollar buys less today, were some of the speaker's observations. On the other hand, he saw an encouraging outlook in the fact that the pure seed movement was growing, that crop rotation was being practised and that several products of the farm had increased in value.

SKYSCRAPERS DEFENDED AND CONDEMNED

In the meeting of the civic development group Harvey Wiley Corbett of New York declared that the skyscraper is not a disease but a solution of business perplexities. He pointed out that it may relieve street congestion and enable business men to conduct operations in limited area. The business day is growing shorter and the volume of business done larger; the skyscrapers now are as essential to efficiency as is the telephone or the automobile. Reduced building heights, he said, to seven or eight stories in the 42d Street area of New York City would require 1½ square miles of new territory and would so lengthen the lines of communication as to promote rather than decrease congestion. It was his opinion that vertical transportation is easier to handle than horizontal transportation. In opposition to Mr. Corbett were the views of Major Henry H. Curran, also of New York, who held that the skyscraper makes for congestion, particularly during rush hours, and that failure to control height spoils the appearance of cities. Because of skyscrapers, Major Curran said, New York is faced with the necessity of putting all of its funds into new subway transportation facilities instead of building sewers, parks and playgrounds.

Reporting to the general session of May 5 on this subject Charles W. Lonsdale, president of the Simonds-Shields-Lonsdale Grain Company, Kansas City, Mo., after reviewing the general discussion pointed out that urban population is steadily growing and that in 60 years, out of a probable population of 150,000,000 people, 67 per cent would live in cities and small urban communities. He thought it encouraging that in recent years the city populations had shown a lower death rate than that of the country. He reminded the chamber of the $1,000 prize which has been offered by the National Real Estate Association for the best opinion on what is the economic height of buildings.

Forecasting what was ahead in the way of problems for those interested in domestic distribution, Robert I. Ellis stated that 60 per cent of the chambers of commerce in the United States were interested in this most vital subject. Distribution, he said, was more intricate in this country than in any other country of the world due to our enormous territory and the high standards of living. He said that business men are primarily interested in what is the status of the chain store and independent store and as to the probability of the manufacturer dealing directly with the retailer and ignoring the wholesaler. Business must have better relations, it was pointed out. Cancellation of orders after the discount had expired is to be frowned upon. Business, Mr. Ellis continued, is facing a relaxation on the part of the consumer and speculative buying was not justified. In his opinion all signs pointed to normal conditions, however. At the group session on domestic distribution on May 4 it was revealed that the Department of Commerce would take a census of distribution in eleven cities; this census is to follow the lines of that recently taken in Baltimore. The gathering of distribution figures, it was explained, is an experiment. If final results are as valuable as they now seem a national survey will be undertaken.

FEAR OF SHERMAN ACT REMOVED

When leading the discussion in the group meeting Judge Edwin B. Parker, umpire of the Mixed Claims Commission, United States and Germany, predicted that now the fear of the Sherman act had been removed from fact-finding there would be little place for government regulations, as business could regulate itself. While business may not act in concert to fix prices or to limit competition unreasonably or to restrict production, Judge Parker declared that it is lawful to assemble facts and distribute them stripped of opinion.

A discussion in the meeting of the finance group, Felix M. McWhirter of Indianapolis, reported, placed emphasis on sound management and upon the necessity for self-regulation of banks. In some sections of the country, said Mr. McWhirter, there was a general impression that there were too many banks and too few bankers. He pointed out that the country could expect only one more reduction in federal taxes, and that these taxes should balance governmental expenses and not show any surplus. He thought it of the utmost importance that a broad study be made of the financial conditions and operation of the Federal Reserve System and that sound conclusions be arrived at in regard to the system. He also pointed out that it is necessary for the financial interests of the country to determine what was of value in an emergency and what was necessary in normal conditions of activity. As far as foreign finance is concerned, the speaker voiced the opinion that Europe must pay and that the money derived from this source should not be used for tax reduction or for governmental expenses.

Speaking for the foreign commerce group, Henry Sharpe, president Brown & Sharpe Manufacturing Company, Providence, R. I., was most enthusiastic as to the outlook of our foreign commerce, particularly so as, coincident with the meeting of the chamber, the Third Pan-American Commercial Conference was being held in Washington. Resorting to figures, Mr. Sharpe revealed that $4,500,000,000 of the United States capital was invested in Latin America; that the trade in 1926 was $835,000,000 in exports and that purchases from the countries south of us amounted to $1,000,000,000, this combined business representing one-fifth of our total foreign commerce. The speaker saw in the Hoch act, recently passed by Congress, which put the Department of Commerce on a par with that of the Department of State, a tremendous factor in improving foreign commerce. He also considered the erection of consular buildings in various countries as having been a great aid in this particular. The American people must show an increasing interest in foreign commerce, and at all times they must maintain an international mind, Mr. Sharpe cautioned. New foreign competition had arisen, he admitted, due to the discovery of metallic producing sections in Europe.

Substituting for H. A. Smith, president of the National Fire Insurance Company of Hartford, Conn., and chairman of the insurance group, James F. Kemble, vice-president of the chamber's insurance advisory committee, reported the insurance group as approaching the coming year with confidence and that life insurance protection now totaled $85,000,000 with fire insurance coverage amounting to $200,000,000. He also reported that nine years extension of longevity was the result of the educational campaigns carried on by insurance companies.

HIGH WAGES RESULT FROM PROSPERITY

Led by A. J. Brosseau, president of Mack Trucks, Inc., of New York, the manufacturing section heard several interesting speakers, the first H. R. Rice, assistant to the president of General Motors Company. In developing his subject, "Wages in relation to Cost," Mr. Rice said: "Our own people have been writing and talking as to the reasons for increased business in the face of declining prices and also without declining wages, either money or real. Many reasons have been given, among them: Small individual profit and quick returns; rapid turnover; plant rejuvenation and the scrapping of good machinery worth many dollars when there was offered better machinery of greater efficiency; absence of trade jealousies or trade secrets; avoidance of waste and attention to time saving; general interest in welfare; prevalence of research; incentive to group and individual exertion; co-operation of labor; absence of geographical barriers; mass production; prohibition, installment selling; lack of class distinction, and every man being a capitalist through stock ownership, etc.

"High wages are more a result of prosperity than prosperity is a result of high wages," continued Mr. Rice. "Prosperity is a result of high average production per man. However, that high production may be achieved, so that the order is, first, high production; second, prosperity and high wages." In the speaker's opinion "the low wage earner from abroad cannot increase his own ability merely by a trip across the ocean. His strength is not multiplied by the short sea voyage. We are not as hard muscled as our grandparents, but the difference in our economic status is that we are able to produce more, not by an increase of muscle, but by brain power, evidenced in equipment, wages and organization. That is the chief asset to our prosperity and our high wages. High wages are a result of high production with low unit cost and cannot themselves be the cause of prosperity. It is for us to make sure," Mr. Rice said in conclusion, "that at this time, when we have been enjoying the period of greatest prosperity in our history, we shall not lose sight of the fact that this prosperity has been caused by and is dependent upon the great production of this nation, in which worker, foreman, manager, organizer and every kind of interest may alike take pride."

Intense enthusiasm was aroused by the next speaker, Arthur T. Morey, general manager of the Commonwealth Steel Company, whose speech is carried elsewhere in this issue of the JOURNAL. Basing his remarks upon the premise that industrial relations have much to do with human happiness, Mr. Morey gave a thorough and absorbing description of the welfare work and general industrial relations program carried out by the Commonwealth Steel Company.

In summing up to the last general session of the chamber the work of the manufacturers' section, Chairman Brosseau said that it was the consensus of opinion of the group that the short week and shorter wages would cause no controversy provided the unit cost did not increase. He next touched upon the increase in the wages of rail workers, pointing out that it was problematical to what extent this would affect industry, the outcome being largely dependent upon whether the rail worker, in consideration of a higher wage, was willing to do more work. Mr. Brosseau announced that his group had prepared a comprehensive plan for 1927 which would include the study of trends, overproduction, mass production, cost accounting, foreign relations, foreman training and industrial production in prisons.

CONGRESS' DISREGARD OF WATER-POWER ACT DEPLORED

At the general session on May 5 Milton Marcus, chairman of the national resources production group, made a notable talk in which he deplored the disposition on the part of Congress to disregard the water power act in dealing with large projects such as those at Muscle Shoals and at Boulder Canyon, also the tendency to interest the government in the production and distribution of hydro-electric power. He pointed out that private initiative and energy have brought us to our present high state in the development of that important industry. Referring to the coal industry, he declared that the experience of recent years has shown the public that, if let alone, it can be depended upon to furnish coal in ample quantity at fair prices. He held that the industry has justified the confidence voted it by the chamber last year when it reiterated its opposition to government regulation or control. Mr. Marcus also urged the enactment of legislation which will make possible the business of growing crops of trees. He stated that three states have already enacted constitutional amendments looking toward the conservation of the forests and that 36 states are giving study to the situation. It was gratifying, he pointed out, that of all the constitutional amendments offered at the last meeting of the Legislature of Wisconsin only the tree conservation amendment was finally passed.

Needs for All Forms of Transportation Predicted

"NEW Trends in Transportation," a scheduled address by R. E. M. Cowie, president of the American Railway Express Company, was, owing to his illness, divided among W. L. Claus, who gave a résumé of the recent developments of waterways; A. J. Brosseau, who discussed the trend of bus and truck transportation, and George D. Ogden, traffic manager of the Pennsylvania Railroad, who presented the rail situation.

Prior to the speeches by these gentlemen several resolutions were introduced. Prominent among them was one dealing with commercial aeronautics, in which it was pointed out that charted airways had progressed and that the American Railway Express Company had contracted for the handling of express through the air. It was urged that the chambers of commerce throughout the country help sell the commercial air routes to the public and that wide patronage was the ultimate solution.

Speaking on the waterways situation, W. L. Claus gave a graphic description of the progress of water transportation made along the Ohio River during the past few years. He stated that the last dam was expected to be completed in 1929, which would afford transportation from Pittsburgh to New Orleans, and that definite recommendations for improving navigation on the Mississippi above St. Louis have been made. In regard to work on the Allegheny River the speaker revealed that locks and dams 4 and 5 are expected to be completed by the summer; lock 6 is scheduled for service next year. He also reported that 45 miles of the Warrior River Canal was now navigable. To add impetus to water transportation Mr. Claus urged that the government relinquish its operations as soon as practical. In substantiation of his contention that the use of inland waterways was on the increase, he gave some astounding figures on the ton-miles of freight handled by the Monongahela River at Pittsburgh.

BUS AND TRUCK USEFUL FOR SHORT HAULS

A. J. Brosseau, who followed Mr. Claus, held that the field of the railroad is the long haul. Trucks, he declared, are being confined more and more to the short haul, while the bus, successor to the lowly jitney, and over-exploited in relation to railroad and civic transportation competition, was held to occupy a definite but not thoroughly understood place in the transportation system. Confronted by a challenge made by the two previous speakers as to the railroad's position toward the truck, bus and inland waterways, Mr. Ogden laid down the very broad principle that what is good for the community is good for the railroad and what is not good for the railroad is not good for business. He also voiced the opinion that as the years went on there would be a demand for all sorts of transportation; he predicted that it would be a long time before transportation facilities would be entirely adequate.

One of the outstanding features of the transportation group session was the fearless attack on a government-owned merchant marine, made by Philip H. Gadsden of the United Gas Improvement Company of Philadelphia. Mr. Gadsden stated that he was against ship subsidy, but expressed the opinion that private business will find a way to support an American merchant marine. Chairman O'Connor of the Shipping Board, in reply, stated that the board favored a privately owned merchant marine if that be possible, but that it is first for a merchant marine. He said that the board is willing to sell any route that operates if a guarantee of five years of operation is given. The prices which will be asked for the ships will not be allowed to be an obstacle to such a deal, he declared. In view of the disclaimer of Chairman O'Connor that the board contemplates investing public funds in new construction and in view of the policy of disposing of all ships and trade rights to private enterprises at any sacrifice, if reasonable assurance of continued service is given, the transportation group decided to take no action in the matter other than to impress the board to use all energy in its power to place shipping in private operation.

Reporting in general for the deliberations of the transportation and communication sections, Mr. Brosseau predicted a better era of relations between the railroads and the public. More than $850,000,000 will be needed by the railroads annually, he stated. The future of railroad expansion calls for sound financing of railroad securities and returns should allow financing through stock issue.

RESOLUTIONS ADOPTED

Of the many resolutions adopted at the chamber's final session, those of particular interest to the electric railway field were on the subjects of taxation, federal, state and local; tax administration; trade relations; revision of postal rates; street and highway safety, and highway bridges. On federal taxation the following statement is pertinent:

> Both sound fiscal policy and equity to taxpayers require a reduction in the tax upon corporations. It is unsound for the federal government to rely upon one source for so large a part of its revenue as it is now obtaining from the corporation income tax. The result is that the government's revenues are necessarily affected by changes in business conditions. The present rates of federal tax upon corporate income are so high that they are inequitable in comparison with the rates upon individuals, unfair as an excessive indirect levy upon the great body of stockholders, and essentially unjust to business transacted in the corporate form, because of the weight of total taxes now accepted by federal, state and local governments.

In the matter of trade relations, the chamber urged "the elimination of all wasteful practices and trade abuses by the formation in each trade of a joint trade relations committee composed of representatives of every branch of trade. Such committees should seek out and define trade abuses and co-operate with the Federal Trade Commission in their elimination."

Regarding postal rates, very definite recommendation were made that they be reduced to a reasonable basis. The resolution reads in part:

> There has been a more or less generally accepted idea that the receipts from the postal service should fully cover all of the costs of that service. This is contrary to accepted business principles and overlooks the fact that efficiency and adequacy of the service should be the first consideration. It also overlooks the fact that Congress, in its wisdom, has seen fit to use the postal service for carrying out governmental policies by the granting and extending of "free" or "less-than-cost" services.

The chamber was equally positive in its position with respect to street and highway safety, declaring that "unceasing vigor should be applied to remedy the situation." The resolution indorsed the principles set forth by the National Conference on Street and Highway Safety and urged active support of its program.

The construction of highway bridges, in the opinion of the chamber, causes financial problems, upon which the following test of a resolution has bearing:

> Whenever after careful survey it is found to be necessary to meet these problems by permitting the erection of toll bridges, authority to build and operate such bridges should be granted only upon definite conditions. These conditions should include a requirement that construction and operation will be under the control of appropriate public agencies with a duty to see that the public interest is in all ways safeguarded and a provision that the right to collect tolls shall cease after there has been opportunity to obtain a reasonable return.

At a meeting of the board of directors today Lewis E. Pierson of New York City was elected president of the Chamber of Commerce of the United States and Edwin B. Parker of Houston, Tex., and Washington, D. C., was named to fill a newly created position of chairman of the board of directors.

Eastern Division—A. J. Brosseau, New York, to succeed Mr. Pierson.

Southern Division—Robert R. Ellis, Memphis, re-elected.

Northern Central Division—William M. Butterworth, Moline, Ill., re-elected.

Western Division—Paul Shoup, San Francisco, re-elected.

Human Treatment of Worker Will Solve Problems of New Business Era

PLACING the whole success of the new business era upon an appreciation of the worker's right to life, liberty and the pursuit of happiness, Arthur T. Morey, general manager Commonwealth Steel Company, St. Louis, made the keynote address at the manufacturing luncheon session of the Chamber of Commerce in Washington on May 3. As far as his company was concerned, declared the speaker, granting workers such constitutional rights had resulted in higher production and lower unit cost.

"Industrial relations have much to do with human happiness," Mr. Morey said. "When the workers of the world receive justice and a due measure of worldly comforts and opportunities one of the greatest causes of human friction and unhappiness is removed. Life, liberty and the pursuit of happiness is interpreted by most people as the right to make, and the blessings of having, a good living. By industrial relations, I presume we mean the relation between labor and management, using the word management in preference to capital which it represents, management being more direct contact. Of old, industrial relations have been dictated by supposed necessity, by economic force, or even by fear and perhaps sometimes by greed, but the better latter-day concept of industrial relations is a condition between labor and management based on equity and good will, American management having come to see that the nearer it can treat men as men, as Americans by Christian standards, can it gain that co-operation, respect and good will of employees that is essential to obtain the best productive effort. It is simply the operation of the law of cause and effect. It seems strange that men ever thought that good results could be got without having set in motion good causes.

WELL-PAID WORKERS CREATE MARKETS

"That sort of good will is Americanizing America to the workers and the workers are extremely important—in fact, the most important part of any community. It is extremely desirable for every reason that our great class of wage earners be self-respecting, well clothed, well housed, well educated and well informed so that they may be intelligent citizens and voters and also gain a greater measure of culture. Well-paid workers create a fine market, and steady work and steady pay we may find will mend a part of our broken prosperity circle and aid in giving us steady good business all the time instead of its ups and downs. By well paid I do not mean paid an existing wage, but a living, saving, cultural wage that makes of a man an upstanding, self-respecting, self-reliant American. Nor is it just money enough. A workman spends a good part of his waking hours in the shop. His job is a big thing to him. His company contacts should be upbuilding and exemplary in evidencing to him justice, fair and open character and friendliness. His job and his environment should be character building."

In developing his subject from this premise, Mr. Morey cited the industrial relations program now operating in the plant of the Commonwealth Steel Company. Among other things he told of how his company has instituted high school courses for the apprentice workmen, with the result that the students were able to take the regular high school diplomas in the public schools of his city. Next he sketched the employee-managed service department and commissary, and explained the insurance plan which was set up several years ago when the company hired an insurance expert to work out with the men a sliding scale of protection that gave each employee insurance policies from $500 to $2,000 and upward.

He next told of the Americanization plan by which "Hungry Hollow," one of the toughest sections of the city, was developed into a civic center with a splendid community building, built by the workers upon land donated by the Commonwealth Steel Company. This work, he said, included new sewers, schools, sewing circles for women, boy and girl scout activities, etc. He also sketched briefly the work of the two fellowship clubs, one for each race; the Home Building fund, which loaned money at 5 per cent without commission, and the fellowship fund, employed in emergencies. In the case of the former the speaker stated that his company had never had a loss, and that two-tenths of 1 per cent loss was the record in the fellowship fund, which had reached over $56,000 in loans. Next the bonus distribution system was explained; it being the attitude of the president, said Mr. Morey, to determine how much and not how little the company's profits should be shared with its employees.

In the realm of safety, the speaker was convinced that the movement as a whole was the opening wedge for better industrial relations in this country. As an example of what safety had done in his plant, he cited the case of the steam pipe gang that had installed 42 miles of piping in four years without a time-loss accident, and of a new pattern shop which had gone two years without a time-loss accident. Continuing, Mr. Morey said:

"It has been our policy to figure about so much per ton on our costs to support our program of safety and fellowship activities. We believe that instead of these being a cost to us, these expenditures have been an efficiency measure and that our costs are lower than they would otherwise be. The cost is not as great as one might think—it is often a matter of willingness to serve and is not a cost at all. Our home loans, fellowship loans, safety work are not costs, for they support themselves. Some of the other activities are practically no cost. I think the better question would be, 'Can we afford not to do these things?' I do not believe we could accomplish the fine product of our company without the good will and hearty co-operation of our men.

"Some concern has been expressed as to whether or not inventions and mechanical improvements will disturb the balance and will cause an excess of labor and unemployment.

"We speak of Newton's law, of the law of supply and demand, etc. I believe we can announce another law. That the consuming power of the world is equal to its creative power. It is proved so already here in America. The sewing machine at first caused riots through great fear that honest women would be thrown out of needlework; it is now recognized as perhaps the greatest single blessing for practical human needs. The early harvester machine was received with attempted destruction; without it today the people could not be fed at any reasonable price. And, too, the trend of modern inventions has been to raise the mentality of the people. The intelligence required under changed conditions is higher and higher and this calls for more and more in our markets. It takes more intelligence and a higher environment to be a motorman or chauffeur than it did to drive a horse car or old-time hack. I do not think we need be disturbed by the displacing of men by inventions and improvements, for I take it on faith that it is a law that no two truthful conditions can conflict.

"I think the thing that need concern us the most is the fellow who tediously and monotonously drives bolt No. 57 all day long instead of being a craftsman with love and interest in his work. Here there must somehow come compensation and adjustments. The eight-hour day helps this situation by giving leisure to turn the mind and interest to constructive things. We may develop conditions further so as to devise a machine to drive bolt No. 57 and do it so as to require intelligent supervision instead of drudgery.

"H. G. Wells says that the common people are happier than ever before in the history of mankind. There seems to be an eternal law of justice and adjustment that assimilates progress.

GOLDEN RULE APPLICABLE IN INDUSTRY

"The world is in flux. The old traditions are slipping. Old reverences are loosening. Long dormant races of overwhelming numbers are awakening. The world, particularly the East, is doubting and sometimes despising the "Western Devils" civilization because of some unfortunate things they have witnessed or experienced. What is going to happen as the world gets smaller and smaller and these great foreign masses of people get aroused and in motion? What is going to happen unless a common principle of conduct for all men is found that is easily explained and easily understood and can influence and govern all peoples?

"We are finding in industrial relations the principle of the Golden Rule is the only rule in human affairs that seems to work. We are going to find that the principle in industrial relations is the only thing that will interpret America to the world. The unrest of the world is among the workers and the peasants. If in America we have a contented and constructive wage earning class—*that* will sell America to the world quicker than any other thing.

The News of the Industry

Expert Suggests M. O.

City of Los Angeles Recommended to Buy Local Lines by Expert Delos F. Wilcox

Dr. Delos F. Wilcox, traction expert, in a preliminary report on local transportation policy filed with City Attorney Jess E. Stephens and the City Council, recommends that the city buy the Los Angeles Railway, Los Angeles, Cal. Doctor Wilcox was recently employed to aid the city in opposing increased street car fares.

The city's consultant emphasizes that he feels no hesitation in recommending that the City Council "take the necessary steps to authorize official inquiries and the preparation of a form of contract to effectuate the plan above outlined for the acquisition of the yellow lines."

With respect to the city's financial ability to take over the car lines Doctor Wilcox is advised that there is plenty of margin within the legal debt limit for this purpose, but that the city deems it necessary to conserve its available credit for still greater enterprises in the field of water supply and light and power development.

He further says that he is advised that Mr. Huntington, having sole ownership and control of the lines, has long entertained the hope that he would be able to sell them to the city at a conservative price and take his pay from the earnings. According to him Mr. Huntington would be willing to take in payment for the system city bonds bearing a low interest rate.

Doctor Wilcox said:

> In street railway operation, where the great masses of the citizens come in daily contact with the service and pay for it as they ride, the public has a better chanoe than in any other utility to insist upon good service and efficient operation.
>
> The good features of the present management ought by all means to be preserved, in case the city should decide to take over the car lines, and the plans adopted should be such as to insure better things instead of worse under public management.

Doctor Wilcox expresses the opinion that the purchase price of the Los Angeles Railway, including its bus lines, would be less than $30,000,000 at the present time.

Discussing the pending rate case, the preliminary report expresses the opinion that a valuation of $40,000,000 or more would be much higher than the "just and true value of the property for rate making purposes."

On the advantages of public ownership, Doctor Wilcox in part says:

> (a) The city would be free from the jurisdiction of the Railroad Commission and could adopt such policies with respect to service and rates as it saw fit, with the unquestioned right to pay for the property out of earnings if it was financially able to do so.
>
> (b) The city would have unrestricted control of extension and betterments, including the expansion of bus service.
>
> (c) The capital investments as a basis for rate making would be stabilized at the actual cost of the property of the Los Angeles Railway Corporation to the city, free from the burden of increasing land values and reproduction costs.
>
> (d) The cost of new capital would be limited to the rates of interest paid on city bonds instead of the rate of return allowed by the Railroad Commission on private investments.
>
> (e) The city would be free, under the present law, from the payment of gross receipts and income taxes on street railway operations.
>
> (f) The city would be able to co-ordinate the service now rendered by different agencies, and establish uniform and non-discriminatory rates. If the city acquired only the lines of the Los Angeles Railway Corporation it would be in a position to extend its lines and service so as practically to compel the co-operation of the Pacific Electric Railway and thus secure most of the benefits of unification, even if it did not own the red lines.

New Chicago Official Acts

Mayor's Advocacy of Unified Chicago Transit Results in Preparation of Bills for Enabling Legislation—Rush Subway Construction Bills—Opinions Differ on City's Right

A LONG-ANTICIPATED move on the part of Mayor William Hale Thompson and the new city administration in Chicago for the settlement of the traction problem was made on May 6, when work was begun on the drafting of bills by the city's legal department. Detailed contents of the bills have not been officially disclosed. It is expected, however, that the measures will be presented to the Legislature at Springfield some time within the next week or ten days in an effort to obtain legislation which will permit the consolidation of the different local transportation agencies, the granting of a terminable permit, the adoption of home rule and the construction of subways by means of special assessments, before adjournment time six weeks hence. The home rule feature, if granted, will be a concession by the companies, which have been seeking terminable permit legislation.

Mayor and Utility Representatives in Private Conference

Both Mayor Thompson and traction officials have agreed that such terms should form the basis of any new contract between the city and the companies. This decision resulted in the bills now being drafted. It was reached after a succession of private consultations in the last ten days between the Mayor and Samuel Insull, president of the Chicago Rapid Transit Company; Albert J. Harris, chairman of one of the Surface Lines bondholders' protective committees; John Hertz, chairman of the Chicago Motor Coach Company, and other local transportation officials and bankers. Alderman J. B. McDonough, chairman of the local transportation committee, has assured the Mayor that his committee will be ready to pass upon the measures within 24 hours after they are presented to the City Council for approval.

If the needed legislation is obtained, expert observers have pointed out, the twenty-year Surface Lines franchise plan of the Frederick J. Lisman interests and the exclusive city-wide bus service proposal of the Chicago Motor Coach Company, both of which are now pending before the local transportation committee, will probably be dropped from consideration.

One of the effects of the introduction of these bills into the Legislature will be to hasten the presentation of the terminable permit bill sponsored by Senator Richard J. Barr of Joliet. This measure, known as the "Barr" bill, has been the cause of an exhaustive investigation in recent months of the terminable permit in practice by a legislative sub-committee.

Discussion of subway construction as a problem independent of the railway franchise difficulties has been renewed by the city officials. Although it is agreed that both should be dealt with concurrently, members of the City Council now favor the speeding up of plans for a subway system to be built by special assessment regardless of the outcome of negotiations for general settlement of the traction problem.

In order to insure construction of subways adequate to the city's needs, Corporation Counsel Samuel Ettelson is now preparing, together with the general traction measures, a bill which would grant the city broad powers in this matter and would cover all contingencies that might arise in connection with subway construction.

Because opinion as to whether the city has the right under present statutes to build subways by means of special assessments differs among lawyers, Mayor Thompson believes it advisable to seek additional legislation to cover the points raised. Lawyers for the city contend that the present laws spreading special assessments for public improvements are adequate to permit the building of subways, while other attorneys hold that enabling legislation is required. The bill now being prepared by the corporation counsel would grant the city the right to build subways by this method, to use the accumulated traction fund of $50,000,000, would give the city the power of condemnation for the building of stations and switchyards and would also grant authority to the city to lease the subways when completed to whatever uses and whatever tenants may be selected.

No Change in Capital Traction Wages

A decision was rendered on May 11 in the wage issue affecting the employees of the Capital Traction Company, Washington, D. C. The arbitration board denied the application of the employees for an increase in wages and the company's application for a decrease in trainmen's wages. Arbitration sessions began on April 9 and after several interruptions were concluded on May 2.

The principal reason advanced by the board for refusing the men's request was the financial inability of the company to give it. Recommendations were made for relief for the company in the form of one-man car operation. The report was signed by Frederick A. Delano, the third arbitrator, and by Stanton Peelle, the company's representative on the board. Arthur E. Holder, representing the men, dissented.

In accordance with the terms of the three-year contract with the organized employees executed in March, 1926, transportation men of the Capital Traction Company prior to Feb. 28 requested a flat rate of 65 cents an hour for conductors, motormen and bus operators, which was 7 cents above the maximum rate, and an increase of 7 cents an hour for all other employees. Following this the company requested a decrease of 2 cents an hour for conductors, motormen and bus operators, with no change in rate for other employees.

Handling of Tacoma's Transportation Problem Criticised

In a report to the City Council of Tacoma, Wash., Kenneth G. Harlan, city statistical engineer, charges that only the inclusion of improper operating charges and computation of returns upon unwarranted valuations prevented the Tacoma Railway & Power Company and its allied company, the Pacific Traction Company, from showing a reasonable rate of return under any of the railway fare schedules which have been in effect during the life of the company. The report is voluminous. Criticism is directed "against improper methods that have been employed to obtain unjust rates and exorbitant valuations."

Approval of the report, and decision to stand squarely behind Engineer Harlan in negotiations for a permanent settlement of the Tacoma transportation problem, was voted unanimously by the City Council in its first session. The fact that the report is almost revolutionary in its character from the standpoint of corporate finance and that it will strongly be attacked was realized by the commissioners.

R. T. Sullivan, manager of the property, said in a letter to all employees:

> 1. Mr. Harlan is obviously strongly influenced by the socialistic doctrine of municipal ownership.
>
> 2. If the newspaper accounts are accurate, one of two conclusions is inevitable. Either Mr. Harlan's interpretation of the financial facts of the company is right, and all the many state officials who have examined our records, the entire committee of 25 appointed during Mayor Riddell's régime and our own men, such as Mr. Wilmot, Mr. Rounds, etc., are wrong, or the many state officials, the committee of 25 and our own men are right, and Mr. Harlan is wrong.
>
> Mr. Harlan was hired as an expert by the city and we have not yet checked his qualifications, having assumed that he is qualified as an expert. We do not know what his previous record has been or is.
>
> It may be necessary to ask the city to call in an expert of recognized standing to interpret Mr. Harlan's report.

Hearing on Houston Fare Awaited

The question of increased fares on the lines of the Houston Electric Company, Houston, Tex., is expected to come up before the City Council in a short time. Members of the city administration have been working on the company's petition, investigating rates in other cities, estimating incomes under various rates and gathering data since the Houston Company submitted its appeal for higher fares early this year. As outlined in the ELECTRIC RAILWAY JOURNAL, issue of March 12, 1927, page 464, the company proposes a fare adjustment based on a sliding scale which will permit regular patrons the same fare as heretofore or probably less and the occasional rider to pay a fare of 10 cents. The company claims improvements which will cost $1,000,000 will be necessary in 1927.

Free Rides in Portland

The Lipman-Wolfe department store, Portland, Ore., on May 2 chartered all the cars of the Portland Electric Power Company between 9 and 10 o'clock in the morning to carry passengers into the city, in celebration of its 77th anniversary in business. Conductors announced to passengers who proffered fare that this was the private car of the Lipman-Wolfe Company. This department store has a contract with the Portland Company to carry its ads on the front of the street cars announcing sales and has used this privilege exclusively for many months.

Jaywalker Scored in Chicago

The pedestrian who ignores traffic signals and rushes across street intersections without their protection has less than one chance in three of reaching the other curb without wasting more time than he saves. This conclusion is contained in the survey report submitted by the Albert Russel Erskine Bureau for Street Traffic Research, Chicago. Beside an investigation into walking habits, other studies made in Chicago's "loop" business district developed that the jaywalker seriously retards the speed and volume of traffic movement. To reduce the congestion and waste of time occasioned by this one phase of the traffic problem the report of the survey recommends that jaywalking be prohibited, with suitable penalties for violation. In order to reduce the inconvenience to a minimum and to introduce a degree of flexibility into the rule, the report also proposes that crossings be placed near the middle of blocks in districts where the distance between intersections exceeds 400 ft., and that in such places pedestrians be permitted to cross with a right-of-way over vehicular traffic.

Public Inquiry Next Step in New York

Negotiations between the New York Transit Commission and the traction corporations for amicable readjustment of the dual subway contracts and unification through agreement have failed. Announcement to this effect was made on May 11 by Samuel Untermyer, special counsel for the Transit Commission. As a result hearings designed to bring all the facts of the situation before the public and to enable the Transit Commission to devise a plan based substantially on the recapture by the city of some important trunk subway lines are to begin very soon.

Mr. Untermyer's statement declared that the Interborough wanted the city to take over the Manhattan elevated lines, which it holds on a lease, but which do not pay, and that the B.-M. T. expressed its willingness to dispose of its surface lines to the municipality but wanted a guarantee of its earnings in perpetuity.

Mr. Untermyer intimated that the companies were unreasonable in their demands. Recapture seemed to be the only answer, he said, if the companies remained in their present mood. He indicated a firm belief that the problem could be solved without increasing the 5-cent fare.

Mitten Bank and Brotherhood Bank Merged in Philadelphia

Mitten Men & Management Bank & Trust Company has merged with the Brotherhood of Locomotive Engineers Title & Trust Company. The two banks will continue to occupy their respective quarters at Market and West City Hall Square and the Lincoln Building in Philadelphia, Pa. Approval of stockholders of Mitten Bank will be asked for an increase in the capital stock of the bank from $3,000,000 to $3,500,000, to care for the present merger.

The letter to stockholders, which included a call to a special meeting for final action on May 28, reads in part as follows:

> In accordance with the terms of the agreement, each stockholder of the Brotherhood of Locomotive Engineers Title & Trust Company will at his option have the right to exchange his stock for stock of the Mitten Men & Management Bank & Trust Company on the basis of two shares of stock of the Brotherhood of Locomotive Engineers Title & Trust Company for one share of stock of the Mitten Men & Management Bank & Trust Company (the last sale of which was at $150 a share), or to receive for each share of his stock $45 in cash. This option must be exercised by writing delivered to Mitten Men & Management Bank & Trust Company, within 30 days after approval of the said consolidation agreement by the stockholders of the Brotherhood Company.
>
> In accepting this proposal, the board of directors has taken into consideration the attitude of helpfulness and co-operation shown by the Mitten Bank toward the working people of this city. The bank has more than kept its promises to the stockholders and depositors of the defunct Producers & Consumers labor bank whom it saved from loss. In the services it has provided, it has made special provision for people of moderate means, and has proved its desire to advance the cause of labor becoming capital. In all of these policies and features, Mitten Bank closely parallels the Brotherhood Bank and the proposed merger will therefore not only maintain for our stockholders and depositors the same advantages which they have heretofore enjoyed but will provide greater resources on which to build for the future.

Legislation for Boston "L" Fails —Valuation Ordered

The House of Representatives adopted on April 26 an order for a valuation of the Boston Elevated Railway, Boston, by the Department of Public Utilities. This becomes effective without action by the Senate. The order follows:

> Ordered, That, as an aid in determining the disposition to be made of the Boston Elevated Railway and its property, including the question of extending or terminating public control of said company, the Department of Public Utilities is hereby directed to investigate the value for transportation purposes of the property of said company, and whether this value is more or less than the option price provided for in Sec. 16 of Chapter 159 of the special acts of 1918, and also whether the value of said property for transportation purposes has been increased during the period of public control through expenditures from carfares and other revenue for maintenance, depreciation reserves or otherwise, and if so, how much.
>
> The department is also directed to investigate as to the reproduction value of the property of said company and to report its opinion as to the amount thereof, less a proper deduction for depreciation and obsolescence. It shall also state its opinion as to the value of the surface lines abandoned by said company. The public trustees charged with the management and operation of said company under said Chapter 159 are hereby directed to furnish said department, on its request, with all facts, figures and other data in their possession that may be of assistance to the department in making such investigations. Said department shall report to the House of Representatives its findings, together with such data as it deems pertinent, by filing the same with the clerk not later than Dec. 1 in the current year.

In commenting on the failure of the Legislature to enact laws to help Boston solve its transportation problem, Governor Fuller said:

> I am tremendously disappointed after urging upon the Legislature in January that the most important matter to come before it had to do with the Boston Elevated; that it should be satisfied in the closing days of the session to promulgate a few questions and then adjourn without doing anything to settle the transportation question for the Metropolitan District of Boston which has to do with the comfort, convenience and accommodation of the working people of this great metropolitan district, and all this without a record vote. This subject has been debated for three years, going on four years.
>
> I should think the members of the Massachusetts Legislature would insist on staying in session if it took all summer to settle this question and settle it right.

Monorail Proposal for Detroit Under Advisement

The City Council of Detroit, Mich., has taken under advisement the question of acting on the proposal of the Rapid Transit Corporation of America to install a monorail line in that city. This course was decided upon following a hearing at which statements made by Del A. Smith, general manager of the department of street railways, about the monorail proposal were characterized by the monorail company's spokesman as "all wet."

The Rapid Transit Corporation proposes to install the system without cost and in return for a share of the fares to let the city operate it for 50 years. Service at 60 miles or more an hour is promised, and it is proposed to operate the line from Miller and Eight-Mile Roads to Jefferson Avenue and thence east across the city, doubling back by way of Chalmers Avenue and Eight-Mile Road.

Utilizing railway to assist refugees

Flood Not Serious for Electric Railways

All factors taken into consideration, the past few weeks have been very difficult ones for the public utilities in the flooded section of the Mississippi Valley states, and next to the work by the Red Cross, these companies have done more than any other one agency to relieve the terrible conditions in the various communities served. The value of their service cannot be estimated.

Contrary to the many reports about conditions in New Orleans, the city is secure and in no danger of being flooded by the waters of the Mississippi River. The New Orleans Public Service, Inc., which controls the important utilities of this section, reports business as usual and independent companies are serving power to adjoining parishes, including St. Bernard and Plaquemines below the city, where an artificial crevasse was created as a further protection to this city.

Outside of New Orleans only three other cities in the lower flood region enjoy electric railway transportation. They are Baton Rouge, Shreveport and Lake Charles. The former, while on the river, is high and dry and the latter two are out of the flood area. According to reports transportation has not been interrupted at Vicksburg, Miss., where the crest of the big flood passed recently.

At the mention of many other cities there flashes in kaleidoscopic view transmission lines patrolled with airplanes and motor boats and fleets of trucks and launches escorting people to safer regions. A fitting tribute was paid the public service companies by Secretary Hoover, following his arrival at New Orleans after studying conditions on the Mississippi. On this point he said: "Had it not been for the transmission lines interconnecting the towns and cities in Arkansas and Mississippi conditions would have been much worse, for no matter where people were forced to go by the floods, there they would find electric service and all of the comforts it implies."

Rebuilt Cars Dedicated at East St. Louis

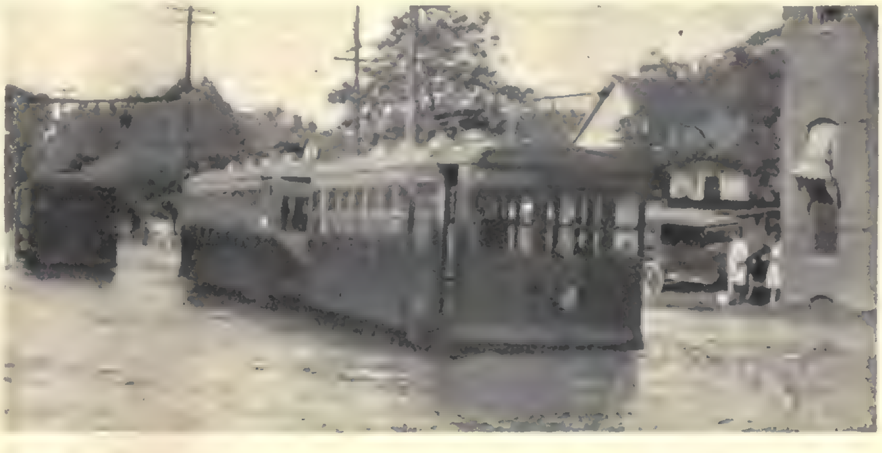
Very unusual dedication ceremonies were held at Jones Park in East St. Louis, Ill., at 2 p.m. on Tuesday, May 10, when prominent matrons of the city christened six "new type" cars for use on the lines of the East St. Louis Railway's Lansdowne division.

It was not generally known that the cars had been rebuilt for the company by the St. Louis Car Company, St. Louis, Mo., as the work was so complete and well done even experts found it difficult to believe that the equipment they were inspecting was rebuilt.

As one of the features of the dedication of the new cars the company, through W. H. Sawyer, president, extended special courtesy passes good during non-rush hours on the city lines to all women of the Lansdowne district who registered at the inspection of the cars. Many took advantage of this offer.

The passes permitted each woman and party to ride between 9 a.m. and 3:30 p.m. and between 6:30 p.m. and 12 midnight on May 10, 11 and 12. The passes were not valid for any part of an interstate fare because of the limitations placed on such service.

The address of welcome was by President Sawyer on behalf of the East St. Louis Railway. This was followed by the unveiling and dedication of the cars. Then came the inspection of the cars by the general public, registration by the ladies of Lansdowne and the parade of the cars with Boy Scout buglers as an escort.



Relentless floods submerged cars at Greenville, Miss.

Safety Crusade in Milwaukee

A street car and a bus crusading in the interest of safety have been placed in operation by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for a month's visual accident campaign, to impress the public with the need of special caution as the seasonal increase in the use of motor vehicles gets under way. Both the car and bus are painted ivory, with safety slogans standing out in vivid green. The car will be operated for two days on each one of the fifteen lines and the bus will be run over the regular bus routes during May. Both vehicles, which transport passengers, carry large front signs "Bound for Safety." They will also be taken to schools, where the driver will tell the children of the increasing traffic hazards.

Gage Change of Radials Opposed

The Council of New Toronto, Ont., has instructed its solicitor to oppose the request of the Toronto Transportation Commission before the Ontario Railway and Municipal Board, for permission to change the gage of the Lake Shore radial line until such time as the board has considered the application New Toronto has before it of what proportion the owners of the street railway are to pay towards the widening of the highway.

Gage-changing is regarded as the crucial step toward linking up the radials with the city system and with each other, enabling the Toronto Transportation Commission to put the resources of each at the disposal of all and effect economies which would at least reduce the annual losses. As one commentator said, it is discouraging to find that neighbor municipalities which now receive electric railway service at Toronto's cost are objecting to the one procedure which can reduce the drain upon Toronto's treasury. It is pointed out that the linking up of radial and city lines will mean better passenger service to the center of the city and quicker express service to downtown points for the people of the territory which the radials serve. A statement said:

> Without the improvement in finances which gage-change would make possible, there can certainly be no improvement in service. Toronto might even be forced to abandon the radials altogether. It is in the interests of all radial municipalities that the York interurbans should be put on a more sound financial basis than that which at present exists. It cannot be done unless the gage is altered.

Providence After Metcalf Trophy

The United Electric Railways, Providence, R. I., has been entered in the 1927 contest for the Metcalf trophy. For the past two years the public utilities of Providence, except the railway, have competed for this trophy. The contest is handled by the Providence Safety Council. *All Aboard*, the official publication of the company, states that the good work now being accomplished by the company should continue. The company hopes that when January, 1928, rolls around it will be found that the record made by it in connection with the factors of the award will be sufficient to bring the trophy to the company. The principal factor for the award is the time lost during the given period, using the number of man-hours worked as the basis.

New Fare Schedule on Northampton Lines

The Northampton Street Railway, Northampton, Mass., has notified the Public Utilities Commission it intends to increase the fares on its lines, effective May 30. The increase in rates is from 1 to 2 cents over the present fare of 7 and 8 cents. Under the new régime a 6-cent fare territory has been established. Under the new plan tickets can be purchased in strips of five for 40 cents, each good for an 8-cent fare; five for 50 cents, each good for a 10-cent fare, and five for 30 cents, each good for a 6-cent fare. Special tickets will be available for one continuous passage between points in section J (Hadley to Amherst) and the railroad station at five for 60 cents. Special tickets at two for 30 cents can be had for a continuous passage from the Academy of Music to any point in the Mount Tom Junction section. School tickets can be purchased in strips of ten at half rates.

Winners Announced in Foshay Advertising Contest

Miss Gertrude Percival, New York, won the first prize of $2,500 in an advertising contest conducted by the W. F. Foshay Company, public utility operators. Second prize went to E. H. Steinmetz, Minneapolis, and to G. S. Ryan, Minneapolis, who made a joint entry. Their manuscript and illustrations won $1,000. Miss Marchette Chute, a first-year student at the University of Minnesota, received third prize, $500. Ten additional prizes of $100 each were awarded.

Coming to Philadelphia: Little Nellie Kelly

Three evenings a week out at the Luzerne carhouse men and women of the Philadelphia Rapid Transit Company are taking fancy steps and repeating smart lines under the direction of a professional dancing and dramatic coach. They have been doing it now for several weeks and the progress so far made augurs well for "Little Nellie Kelly," to be produced at the Academy of Music on May 16, 17 and 18, the proceeds to go to the helping hand fund.

There is talent galore among the employees, and it is not the first time they have put on a show, but no other show has ever provoked so much comment in anticipation of its presentation. This isn't blah. It's a fact. Even the *P. R. T. Co-operator*, Vol. 1, No. 3, for April 28, 1927, was out in new dress in honor of the event. Never before, so far as can be remembered, did the little paper contain such uproarious cartoons. Never before did it scintillate so much with stage stories. Even Mr. Mitten must have rubbed his eyes when he gazed upon the cartoon of Joe Holland and Dorothy Snyder as "Jerry Conroy" and "Nellie Kelly."

News Notes

Seeks Ten-Cent Rate.—Right to collect a 10-cent fare on its Sandusky, Ohio, city lines is sought in a franchise proposal presented to the City Commission recently by the Lake Shore Electric Railway. The franchise under which the company is operating there expired a year ago. Commissioner Schade said that although the present 5-cent fare was likely too low, prevailing conditions considered, he would never vote to permit a 10-cent charge.

Railway Carries Morning Mail. — Early morning mail from Milwaukee will hereafter be carried by the interurban cars of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The United States postal authorities have granted the request of the citizens for this service, which will be started at once. The Waukesha newspaper commends the railway for its speedy co-operation in serving the city with morning mail.

Modern Methods in Sacramento.—Cars of the Pacific Gas & Electric Company operating in Sacramento, Cal., will hereafter be designated by numbers rather than by street names, as in the past. The numbers will be carried in a conspicuous place on the cars and for the convenience of the public the street name of the line will be carried on the dash of all cars for the time being. This announcement was made by E. W. Florence, division manager, who also said that hereafter in the issuance of transfers it will no longer be necessary for the passenger to inform the conductor or motorman where he was going. Under the new system he need only request the transfer.

Close-Ups in Boston.—The Boston Elevated Railway, Boston, Mass., is running on the cover of *Co-Operation*, its pamphlet, close-ups of its employees in various departments. The subject may handle plant or equipment with a view to maintaining it. The April issue shows the car operator handling his equipment by giving direct service to the patrons of the railway. After a glance at the close-up the reader is directed to another page which explains the illustration and the duties of the operators.

Extend Service Over South Side Route.—Direct and more frequent service to downtown Chicago was made available on April 10 to a heavily populated district in the extreme southeast portion of the city when the route of the through Cottage-Grove-South Chicago Avenue cars, heretofore turned back at 93d Street, was extended nearly 5 miles to Ewing Avenue and 180th Street. Under the new plan no transfers will be necessary to reach the downtown district, the headway over this line will be slightly increased and considerable duplication of local, crosstown service will be eliminated. Use was made for the greater part of the distance of tracks over which the Hammond, Whiting & East Chicago interurban cars operate.

Recent Bus Developments

Gary Railways Supplements System with Coach Lines

Two new motor coach lines in Gary, Ind., have recently been added to the coordinated railway and motor coach system of the Gary Railways. The new routes serve a section of the city heretofore without public transportation of any kind. They provide in one instance a special luxurious type of express service and in the other a local service during rush hours to and from the steel mills.

Coaches of the former line, known as the Broadway-52d Avenue service, operate on an hourly headway over a route 5⅝ miles long between a high class residential district on the south side of the city and the downtown station of the Chicago, South Shore & South Bend, where connection is made with fast electric trains for Chicago.

The route is paralleled three-quarters of the way between terminals by street car tracks, on which a fifteen-minute headway is maintained. The motor coaches operate as expresses for about one-half the distance through the downtown sections, the running time for the same distance being from eight to ten minutes less than that of the street cars, which make all stops. The fare charged is 15 cents, compared with the 8-cent street car rate. Transfers are issued to other car and bus lines.

One of the coach routes just added, and known as the Harrison Street line, is approximately 6¼ miles long. It serves a newly developed residential area in the southwest portion of Gary as well as a densely settled section of foreign population lying close to the downtown business district. Service is maintained with 21-passenger city type motor coaches during the morning and evening rush hours only. The fare is 10 cents with universal transfers. Both lines have been established for an experimental period of 90 days by agreement with the city administration.

Hearings on Albany Bus Fare Concluded

Commissioner Lunn concluded the hearings on May 11 on the petition of the Capitol District Transportation Company, Inc., for a change in its passenger rates of fare in Albany, Troy, Cohoes, Rensselaer and in the town of Guilderland, in New York, and for permission to file new tariffs. The bus company seeks to have the fare the same as that charged by the United Traction Company, the bus company being a subsidiary of the traction company and supplementing its operation. The application of the traction company for change in fares has been heard by the commission and decision is pending.

At the beginning of the hearing on May 11, Michael D. Reilly, counsel for the city of Albany, asked for the dismissal of the petition on three grounds: First, that the question of segregation of the various lines of the company was still before the commission for decision; second, that the city questioned the right of the company to use as a basis for calculation for rate-fixing purposes the value of property which the traction company or the bus company leased or rented from other companies, and third, the right of either company to use as a rate base the reproduction value of its property, without allowance for depreciation. In connection with the question of segregation, Mr. Reilly called attention to the franchise granted by the city of Albany to the bus company in which it was provided that fares and transfer privileges applicable to the United Traction Company would be the same as for the bus company.

Commissioner Lunn stated that inasmuch as the two cases were so closely related, he would receive the evidence and refer the questions to the commission. Briefs are to be in May 25.

Duplication Not the Answer in Buffalo

The New York State Public Service Commission has issued an order denying the application of the Buffalo Motor Coach Corporation, Buffalo, for a certificate of public convenience and necessity to operate four bus lines in Buffalo in competition with the International Bus Corporation, a subsidiary of the International Railway. In a memorandum on the application, Chairman William R. Pooley called attention to the fact that the International Railway covered 23 miles of the proposed routes of the Buffalo Motor Coach Corporation and the International Bus Corporation operates three lines which serve practically all sections of the city. In its order the commission says that duplication of transportation is not the solution of Buffalo's transit problems. The report was unanimous.

The Buffalo Motor Coach Corporation is sponsored by Ernest M. Howe, Detroit. The company was granted franchises by the Buffalo City Council for the operation of four bus lines in the city on an 8-cent fare with free transfers to connecting lines. The International Bus Corporation charges a 10-cent fare.

Pennsylvania 3-Cent Gas Bill Signed

The 3-cent gasoline tax bill in Pennsylvania was signed by Governor Fisher on April 13. It is estimated that this will produce $22,000,000 of revenue for the next biennium. The bill makes the current 2-cent tax a permanent impost, with the extra cent an emergency levy for the next two years. Provision was made that the entire amount collected from the extra cent—or temporary tax—will be placed to the credit of the motor fund for use by the Department of Highways. The counties will receive one-fourth of the permanent tax of 2 cents a gallon.

Bus Bill Gives Wisconsin Commission Control

After prolonged efforts, street railway interests, independent bus operators, the league of municipalities and the brotherhood of railroad engineers finally agreed on a proposed bus bill and appeared before an assembly committee in Madison, Wis., in support of its passage. Truck owners were the only objectors. The committee recommended the bill for passage immediately after the hearing.

The bill places buses under the regulation of the Wisconsin Railroad Commission, provides for the issuance of a permit to operate, regulate routes and fares and calls for a fee of $25 for a certificate, with an additional charge of $40 for each bus. A special tax is placed on the basis of weight and miles traveled. Cities are given the right to designate routes and to charge a special fee.

Seeks Bus Permit.—The Milwaukee Electric Railway & Light Company has requested the Common Council for a permit to operate a new bus line between North Milwaukee and the A. O. Smith Corporation plant, with transfer privileges to the Milwaukee cars. The request was referred to a committee.

No Stage Line Needed.—Finding that the service maintained by the Petaluma & Santa Rosa Electric lines is adequate and efficient, and that its connections with the Northwestern Pacific Railroad and the Sausalito, Petaluma & Santa Rosa Stage line are adequate and convenient, the Railroad Commission recently denied the application of C. A. Johnson for a certificate to operate a stage line connecting Sausalito and Sebastopol.

Field of Toronto Commission's Activity Extended.—Power has finally been given to the Toronto Transportation Commission, Toronto, Ont., to operate bus lines outside the city. The commission made a strong bid to have the board of control of Hamilton withdraw its opposition to the private bill, which would enable the commission to operate such service. During the week of May 1 the Toronto-Niagara Falls buses ran to Niagara Falls, N. Y., for the first time. Many local manufacturing interests supported the claims of the commission for legalizing operation of the route to Niagara Falls and operation for chartered bus parties.

Buses Substituted.—The Public Service Commission has granted the petition of the New York & Stamford Railway and approved the declaration of abandonment of the line in Port Chester on North Main Street from Mill Street to the state line between New York and Connecticut. In December, 1926, on petition of the company, the commission granted a petition for the abandonment of the Westchester Avenue line and the North and South Regent Street lines. Permission is granted by this order to abandon the remaining portion of the route on North Main Street, which the company alleges should have been included in the previous application. Buses have been substituted for street cars, operated by the County Transportation Company.

Financial and Corporate

Dividend Policy Explained

Circumstances Connected With Passing of Brooklyn City Dividend Reviewed —$11,000,000 for Improvements

The directors of the Brooklyn City Railroad, Brooklyn, N. Y., at a meeting held on May 3 determined that it was to the best interests of the company that no dividend should be paid at this time. The directors felt this suspension of dividends would be a hardship to many, but the earnings are being put back into the property, constantly increasing its value. This will, of course, accrue to the benefit of the stockholders.

The facts thus set forth were made plain in the ELECTRIC RAILWAY JOURNAL for May 7. They tell only part of the story. The company is earning in excess of $1,000,000 a year over and above all operating expenses, reserves for renewals and replacements and a sinking fund sufficient to purchase new rolling stock at the expiration of the life of the rolling stock bought in recent years, and interest on its outstanding bonds and car trust certificates. This does not include the annual installment on the principal of the car trust certificates, amounting to $375,000 a year. The officers of the company have been advised that these cars are capital improvements and they expect that securities will ultimately be issued to reimburse the treasury of the company for these expenditures.

As a matter of fact a plan presented by the directors for a general and refunding mortgage and the sale of $2,500,000 of 6 per cent bonds to be issued thereunder was approved by the stockholders on Dec. 7, 1926, and again at the annual meeting of the stockholders, held on Jan. 10, 1927. Application was then made to the Transit Commission for its approval. Hearings terminated on Jan. 24, but on March 10 the commission denied the application, with leave to the company to renew. The commission, in its decision, raised a number of questions which involve the lease dated Feb. 14, 1893, to the Brooklyn Heights Railroad and the so-called construction account, now in litigation.

Since the separation of the property from the Brooklyn Rapid Transit in October, 1919, the Brooklyn City Railroad has expended for the purpose of extending and improving its service approximately $11,000,000 for capital additions, betterments and improvements. Of this amount approximately $1,000,000 was derived from the sale of capital assets. Additional securities have been issued and are now outstanding in respect of such expenditures as follows: $4,000,000 of stock issued in September, 1924, as a stock dividend and $3,000,000 of equipment trust certificates, of which $750,000 have been retired. The balance of such capital expenditures, something more than $3,000,000, the railroad's officers believe could be capitalized under the law. In the belief that the commission would approve the proposed general and refunding mortgage and the issuance of securities thereunder, which the company had arranged to sell, it borrowed some $800,000. The action of the commission denying the application must result in a considerable delay in any proposed financing. H. H. Porter, president of the company, points out that under decisions of the Supreme Court of the United States in valuation cases concerning other utility companies the property of the Brooklyn City Railroad has a value largely in excess of the par value of its stocks, bonds and all other securities.

Texas Line Surrenders Railway Charter

Economic necessity is given by the Paris Transit Company, Paris, Tex., as the reason for the surrender of its charter to the Secretary of State. The company has owned and operated the railway system of Paris 37 years. It began with old-time mule cars, but in 1894 it converted the system to electric operation. Notwithstanding the fact that Paris has grown to a city of more than 15,000 population, the company finds itself unable to compete with the private automobile and the "For Hire" car and has decided to abandon its lines. W. G. Moore, manager, said that in authorizing fare increases and preventing bus competition the city officials had undoubtedly prolonged the life of the company, but the competition from privately owned automobiles reduced the revenues of the company to a point where hope had disappeared that the line could ever again be made profitable. The company operates 5.5 miles of line.

Philadelphians Purchase Washington-Virginia Road

The Washington-Virginia Railway, which operates a railway line connecting Mount Vernon, Alexandria, Washington, D. C., Falls Church and Fairfax Courthouse, has been sold under the hammer, including equipment, and brought $575,000. The purchasers represented bondholders and noteholders and were all Philadelphians. It is understood they will operate the road just as soon as the sale is confirmed by the court.

The property was sold in parcels. Lewis H. Parsons bought the Mount Vernon division, extending from Washington to Mount Vernon, for $300,000; the Falls Church division went to John McMullin of Philadelphia for $150,000; the equipment to John Wayne of Philadelphia for $125,000.

The road has 60 miles of track and there were outstanding bonds totaling $3,500,000. It has been in the hands of receivers since November, 1923.

Approval of $20,000,000 Brooklyn Refunding Issue Sought

The New York Rapid Transit Corporation, the subway operating subsidiary of the Brooklyn-Manhattan Transit Corporation, applied to the Transit Commission on May 7 for permission to issue $20,000,000 in additional refunding mortgage 5 per cent sinking fund gold bonds. The proceeds will be used to cover $3,375,000 spent for equipment from July 1, 1923, to April 1, 1927, and $12,625,000 for the purchase of equipment for subway and elevated lines.

William S. Menden, president of both the B.-M. T. and the Rapid Transit Corporation, told the commission that the B.-M. T. proposed to take over the $20,000,000 in bonds at 80 per cent of par, or to pay $16,000,000 for them. He said this was all that could be obtained for the bonds in open market. Duncan A. Holmes, vice-president Chase Securities Company, confirmed this assertion, and added that 80 per cent was all the bonds would fetch.

Of the $12,675,000 to be spent, $9,700,000 will be for operating equipment, mostly for 363 new steel cars which the company has been directed by the commission to buy, and $2,700,000 will be for the Fourteenth Street-Eastern line shops and yards. Transit Commissioner Leon G. Godley reserved decision on the application.

Stockholders of Grand Rapids Company to Meet May 25

Stockholders of the Grand Rapids Railway, Grand Rapids, Mich., at a special meeting on May 25 in Grand Rapids, Mich., will act upon the proposed readjustment of the finances of the company in accordance with the plan outlined in the ELECTRIC RAILWAY JOURNAL for April 16, page 718. This plan of readjustment contemplates the organization of a new company to take over the assets of the present company and the cancellation of all of its common stock, and extinguishment of $600,000 of its indebtedness through the issue of common stock of the new company, and the exchange of preferred stock on the basis of two shares of new company common stock for one share of present preferred stock, the depositors of which are also offered subscription rights. The plan also provides for the authorization of additional preferred stock by the new company to provide funds further to reduce existing indebtedness and for other corporate purposes.

Question of P.R.T. Underlying Companies Again

Governor Fisher of Pennsylvania on May 3 signed the Daix bill enabling the city of Philadelphia to institute proceedings for the condemnation of the underlying companies of the Philadelphia Rapid Transit Company and the Philadelphia Rapid Transit Company itself. Under the Daix act the city need not take the entire system, but may condemn the underliers only, if it so desires. Mayor Kendrick expressed satisfaction when he heard about the Governor's act. He said he thought it was a step in the right direction and would aid materially in the solution of the transit problem in Philadelphia at some future date. Under the Daix act the city could condemn and acquire not only all surface, underground and elevated transit facilities but also buses, taxicabs and trackless trolleys within the city, and leases for such operation and all plant and equipment connected with these facilities.

Seattle Financial Status Improves

The Seattle Municipal Railway system, Seattle, Wash., is recovering from the strain of a $1,100,000 bond interest and principal payment which followed refusal of the local banks to assist the utility over a financial emergency. By June 10, it became known recently, the railway will have paid off, out of its current earnings, $735,000 loaned from other city funds to tide it over the recent crisis and will have no indebtedness outstanding except bonds and warrants representing capital investment.

In order to have ready the money due on March 1, 1927, to Stone & Webster as interest and principal on the railway purchase bonds, the city treasurer started on Dec. 19, 1926, to turn all the railway's daily receipts into the special bond interest and redemption fund. At the same time the railway's current fund, known as the city railway fund, was placed on a warrant basis. When the banks refused to cash the payroll warrants, two loans totaling $735,000 were made from the city light department. So rapidly have these loans been repaid that now only $250,000 remains unpaid. It is expected this sum will be wiped out within the next five weeks. On Aug. 1, 1927, it will be necessary to have on hand $255,050 to meet the semi-annual interest payment on the purchase bonds due on Sept. 1, but the city officials believe this can be handled without the need of putting the railway fund on a warrant basis.

Figures Show Trend in Sioux City Since Fare Increase

In March, 1927, the first month the rate of fare on the cars of the Sioux City Service Company, Sioux City, Iowa, was advanced to 8 cents and two tickets for 15 cents, passenger revenue showed an increase of only 2.20 per cent, while the revenue passengers showed a decrease of 13.8. That month happened to be a poor riding month due to nice weather and also to the agitation over the fare increase. During April, a good riding month due to rainy and cold weather, the passenger revenue increased 11.09 per cent, while the number of revenue passengers decreased 6.43 per cent. This is in line with the previous decrease in the company's revenue passengers.

Company officials are said to believe this condition to be difficult to correct as it is due to the preponderance of automobiles. During 1926 the company suffered a decrease of 7.60 per cent in the number of revenue passengers carried and 7.70 per cent in passenger revenue. The old rate of fare was 7 cents with four tokens for 25 cents.

Passenger Receipts Slightly Lower in Allentown

The operating results of the Lehigh Valley Transit Company, Allentown, Pa., for 1926 do not compare favorably with those of former years. This was the initial statement of P. B. Sawyer, president, in his report to the stockholders. Passenger receipts are still on the decline, although the loss has been offset in a measure during the latter part of the period by the establishment of bus service operated where that form of transportation appears to be practical and more economical than railway service. Owing to increased expenditures for maintenance, the current operating expenses have increased approximately 2 per cent.

CONSOLIDATED INCOME ACCOUNT OF THE LEHIGH VALLEY TRANSIT COMPANY AND SUBSIDIARIES FOR THE YEARS ENDED DEC. 31.

	1926	1925
Total gross earnings........	$4,950,443	$5,047,104
Total operating expenses including taxes..............	3,710,217	3,603,062
Net earnings from operation	$1,240,226	$1,444,041
Income from interest on bonds	977	906
Income from interest on notes and deposits..............	28,025	3,618
Income from dividends on stocks....................	110,075	110,075
Total net earnings.......	$1,379,303	$1,558,642
Depreciation allowance.......	$277,712	$377,798
Interest—funded debt........	599,585	599,802
Amortization of discount and expenses.................	21,593	21,705
	$898,890	$999,306
Net income...............	$480,413	$559,335

The physical property of the company has been adequately maintained and the transportation service supplied to the public has been kept up to the past standard.

With the approval of the Public Service Commission, the company has abandoned 11.9 miles of line between Wales Junction and Chestnut Hill and the service is now being supplied by buses, operated by the new subsidiary, the Lehigh Valley Transportation Company. In addition to this service, the company has entered new territory with a bus line operating on Turner Street, Allentown. These additions bring the total buses operated by the bus company to sixteen, covering four routes.

The company is now operating, in addition to the bus service 312 passenger, freight and work cars, over 203 miles of track. The accompanying table shows the income account for 1926 compared with 1925.

Depreciation Case Goes Over

Postponement has been secured by the electric railways of the hearing by the Interstate Commerce Commission on the depreciation case. This deferment will hold until further order of the commission.

Lucius S. Storrs, managing director of the American Electric Railway Association, said that the electric railways were fortunate in having additional time to prepare carefully the case of the electric carriers and must be able to present to the commission the complete economic and statistical aspects of the theory of depreciation as applied to the electric railroads and as called for by the forms previously sent out. For the purpose of having this complete presentation it will be necessary actively to continue collecting and collating the statistics of the industry. The committee now at work desires the hearty support and co-operation of all in the industry. All those who have not already filed their answers to the association's depreciation questionnaire are requested to do so as promptly as possible.

Net Earnings Show Improvement.—For the year ended Dec. 31, 1926, the gross revenues of the railway department of the Northern States Power Company and subsidiaries were $268,705, against $277,578 for the year previous. Net earnings showed a loss in 1926 of $30,654, against a loss in 1925 of $61,858. The Northern States Power Company is operated by the Byllesby Engineering & Management Corporation and runs railway lines in Fargo, N. D.; Eau Claire and Chippewa Falls and a line connecting Eau Claire, Chippewa Falls and Altoona.

Defaults on Bond Payment.—Talmadge G. Cherry, vice-president of the Rochester & Syracuse Railroad, Inc., Syracuse, N. Y., announced on May 2 that the company was obliged to default the payment of $62,500 interest on the $2,500,000 of 5 per cent gold bonds of the company. Mr. Cherry declared that the road would continue to function as in the past.

Net Income Increases.—For the first quarter of 1927 the gross revenues of the Twin City Rapid Transit Company and subsidiaries, Minneapolis, Minn., were $3,665,898, against $3,839,102 for a similar quarter of the year previous. Operating expenses fell off from $2,794,755 to $2,608,388 for the 1927 quarter. After the consideration of fixed charges and taxes the net income for the 1927 quarter was $481,402, against $448,360 for the first quarter of 1926.

Deficit in Buffalo.—For the three months period ended March 31, 1927, the operating revenue of the International Railway, Buffalo, N. Y., was $2,515,944, against $2,709,594 for a similar period in the year previous. Expenses and taxes increased from $2,283,271 in the 1926 period to $2,290,797 in the 1927 period. After the consideration of income deduction, the three months operation of 1927 ended with a deficit of $124,888, against a net income of $64,298 for the period from January to March, 1926.

Settlement of Affairs of Indianapolis Property Awaited.—A step nearer settlement of the affairs of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., was taken recently with attorneys filing additional special findings in the foreclosure of the $2,000,000 mortgage. Resumption of the case follows a recess due to the death of Charles L. Henry, founder of the line and its president and receiver. It is expected that Judge Will M. Sparks of the Circuit Court at Rushville, Ind., will name another receiver. More than fifteen attorneys, representing many clients, are interested in the case.

Book Reviews

Mathematical Principles of Finance—Second Edition

By Frederick C. Kent. New York, N. Y.: McGraw-Hill Book Company. Price, text alone, $2; text with tables, $4; table alone, $4.

Frederick C. Kent, associate professor of mathematics Oregon State Agricultural College, has revised this textbook on the mathematics of investment and insurance. In the new edition special attention has been given to interpolation methods. The original problems have been simplified and many additional practical problems have been added. The book covers the fundamental principles of the theory of interest and annuities and gives application to valuation, depreciation, amortization and other financial elements.

What Price Progress?

By Hugh Farrell. New York: G. P. Putnam's Sons. 323 pages. Price, $2.50.

Here is a book akin in some of its aspects to "Anticipations," by H. G. Wells. The subject of the author is the stake of the investor in the discoveries of science appraised in the light of the question: Is America keeping step with the rest of the world in the application of science to industry? The publisher of "What Price Progress?" is correct in his statement that this book answers that question. It boldly sets forth that which is and that which is not being done toward holding the country's place in the economic world. And the author does so in simple, non-technical language, in a style that has been likened to that of Matthew Arnold.

Not many of us have thought about it in that light, but the chemist is making a new world. Mr. Farrell makes plain how this is being done. He also makes plain how many other things are being done. He has a positive genius for uncanny presentation of facts. What, for instance, could be more engrossing in a discussion such as that of Mr. Farrell's than to couple under one head paint, silk stockings and dynamite and at another point phonographs, photographs and philanthropy. There is alliteration in the one and the idea of catastrophe in the other.

It is hardly an exaggeration to say that the book should appeal to everybody everywhere with an intelligent interest in the progress of industry. Of special interest to railway men is the chapter "Science and the Railroads." Here much that is controversial is touched upon by the author, but whether or not one agrees with all that Mr. Farrell says, there can be no question about the stimulating effects upon the reader of what he has set down. The author sees the railroads in the grip and under the domination of the rate makers. He says their only hope of adequate returns on their capital appears to lie in the direction of increased efficiency and lower costs of operation. Least of all, can they afford to look with complacency upon the drying up of the sources of new knowledge.

While he does not minimize the good work along scientific research lines that has been done in the United States, Mr. Farrell feels that there is not in this country the interest in and the understanding of the immense importance to every sort of scientific research, both pure and applied, there should be, and that unless industrial leaders and investors change their methods and bring American industry to the front by full utilization of scientific help it is likely to be outstripped in the keen competition of these modern, scientific times. He says:

> Every application of science which results in lower production costs through either a saving in labor or in raw materials, or which gives a new, useful product or increases the use of old products is directly beneficial to every man, woman and child living in the areas served by the industries making the improvement. The benefits extend even beyond that, they go to generations yet to come and to remote corners of the earth.

At the risk of repetition, be it said again of Mr. Farrell that there is nothing of Dryasdust about him.

Making Transportation Pay

A digest of presentations made by electric railways to the Charles A. Coffin Foundation; edited by Henry H. Norris, with an introduction by Frank R. Coates. American Electric Railway Association, New York. 227 pages, exclusive of appendix and index. Price, $2.

Important changes have been made in this, the fourth in the series of "Electric Railway Practices." Most significant, of course, is the change in name of the volume to "Making Transportation Pay." Sprinkled through the book at the bottom of some fifty pages are principles which start with "Better Service Is the Answer to the Problem of Competition," and finish with "A Fair Valuation Includes Going Value." It may appear that emphasis of the last-mentioned innovation just at this point is out of proportion to its significance. While the change is, of course, one of typography, it is noteworthy because it has resulted in emphasizing principles that need constantly to be reiterated. This list of principles, for that is what it really is, distributed throughout the chapters epitomizes many of the outstanding characteristics of good electric railway service in a form calculated to attract attention. The principles should prove useful in advertising, in educational work and in other directions. They are in line with the general tendency to formulate codes and creeds based on experience and conviction. The principles are based on the text of the book, but the editor has had the co-operation of the managers of the companies represented in the volume in formulating them and in estimating the relative importance of the different achievements of the companies.

If ever a book were the bible of an industry, "Making Transportation Pay" is that book. This does not mean that the practices set forth therein are the only ones to be followed in a given case. No one would be so foolish as to make any such claim, but the practices of the contestants as set forth represent the application of principles that have been tried and not found to be wanting. The topics were selected and the material classified to show, first, the present status of the electric railway as a revenue producer, as a public service agent and as a part of the community. Then the ways in which this status has been improved are described. Finally, the means for operating a property more economically and smoothly are taken up and illustrated.

As H. H. Norris, the editor, points out, a comparison of this volume with its predecessors will disclose the particulars in which progress is being made most rapidly at present. Most noteworthy is the place being given to the bus. Co-ordination of rail and bus is already taken as a matter of course, but numerous details are still in the problem stage. Progress is being made in the accounting aspect of co-ordination. It is essential to know just what bus operation is costing in order that service may be rendered with full knowledge even if it cannot be directly profitable.

Attractiveness of all equipment is another element now recognized as essential to good service. Cars and buses are being designed with due reference to comfort, brightness, noiselessness and safety, all features which appeal to the public. This does not imply that the operating and maintenance features, like durability, general reliability and low power consumption, are being overlooked. The reverse is true. But the aim is to make service salable, as well as efficient; hence the present stress on items of strong public appeal. This leads directly to salesmanship, which now is taken to include a wide range of activities, such as public relations, advertising and ride-selling fare plans, as well as direct selling.

From the beginning of the series the "Practices" have been segregated somewhat in order to make them readily accessible for reference. In the present volume the segregation has been carried farther, bringing together, for example, in one chapter the items of greatest interest to the master mechanic, in another those of interest to the way engineer, and so on. Thus construction and maintenance in a given department are brought together, which will render easier than before the finding of any one class of articles.

But to return to the physical makeup of the volume. In the early part the electric railway is considered largely from the standpoint of the public; in the latter part from that of the management. In other words, the quality of the service is first set forth and then the ways in which the quality is maintained are taken up in detail.

In his foreword to the volume Frank R. Coates, president of the American Electric Railway Association 1925-1926, is correct in the statement of his belief that it will profit every electric railway looking for ways to make public transportation pay to study carefully the many methods employed by all of the contestants for the 1926 Charles A. Coffin award. In fact, the main title, "Making Transportation Pay," was selected for the volume because it epitomizes the present trend of managerial thinking. The book shows that transportation is being made to pay, and therefore can be made to pay even more generally. Still more important than this, the volume tells how to do it.

Benjamin Garver Lamme

Late chief engineer of the Westinghouse Electric & Manufacturing Company. An autobiography, New York, N. Y.: G. P. Putnam's Sons. 1926. 271 pages. Price $3.

B. G. Lamme was a great engineer, and his autobiography is more than an account of the personal accomplishments of the man. Beneath the record of events which is set down the reader will quickly discern the reasons for the author's success. It is true that the book is primarily an engineering history, but as much as Mr. Lamme might seek to mitigate his own part in the record of engineering accomplishments the record of his interest in people and his sympathy for the problems arising from human causes shines through the formal record. This was inevitable. And the human characteristics weave themselves into the descriptive matter so inconspicuously as to hold the reader's attention. One forgets the leaven because the bread is so good.

The manuscript covers a record of his first thirty years of engineering work. After it was nearly completed Mr. Lamme began to revise the material. This work he never completed. In editing the two manuscripts an attempt has been made to give every thing possible from his own memorandum to cover the development in the art of designing dynamo-electric machines.

The material has been grouped into ten chapters with an appendix. The first covers the life of Mr. Lamme from birth through college. The second relates his early test room experience and the third early machines from pre-calculated designs. The next four chapters cover different periods of development. Chapter IV covers the period of 1892 and 1893, with its relation of the work done for the World's Fair and on the Niagara power development. Chapter V takes the period of 1893 and 1894, when the induction motor began to receive serious consideration. Another chapter covers the period from 1895 to 1900, with its demand for alternating-current motors for use in hoist, crane work and the like. Railway electrification is treated in Chapter VII, which covers the period from 1901 to 1919. Three other chapters cover other lines of work done by Mr. Lamme, his personal traits and hobbies and his recollections of some old timers. On the whole, the work is an intimate history of the pioneer development of electrical engineering by one who took a leading part in it. It is especially inspiring to the young engineer.

Personal Items

Burt Hamerstrom Vice-President at San Francisco

Burt Hamerstrom, manager of the commercial department of the Market Street Railway, San Francisco, has been elected a director and a vice-president of the company. Mr. Hamerstrom will continue in charge of the commercial department. No other changes in the directorate or officers were made.

Mr. Hamerstrom's appointment to the company was noted in the ELECTRIC RAILWAY JOURNAL for Oct. 16, 1926, page 749. He spent about ten years as a newspaper reporter and feature writer in San Francisco, Chicago and Seattle. For more than ten years he has been associated with public utilities, serving with the United Gas Improvement Company and Welsbach Company in Philadelphia and with the North American Light & Power Company—Illinois Power & Light Company—in Chicago, where he helped to direct the commercial, customer-ownership, public relations and advertising activities for properties in more than 100 communities in several states.

Charles E. Smith Expert in New York City

With the keys of the city which were unofficially presented to him, Charles Edward Smith, transit expert, will try to unlock the Times Square door for the outpouring of New York City's millions. Mr. Smith, who was appointed by Comptroller Berry to make a transit survey, has already started upon his task, as was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of April 16, page 712.

This Western expert, who will likely submit his report between May 30 and June 1, has had broad experience in railroad construction, in municipal development and in the service of the government. From 1897 to 1908 he acted as civil engineer for various municipalities, railroads, industrial organizations and for the government. In 1908 and until 1915 he was in charge of the maintenance and new construction of 7,000 miles of railroad for the Missouri Pacific. At that time he entered private practice in St. Louis, remaining in that work from 1915 to the outbreak of the war.

Since the war and with the exception of the interruption for war service Mr. Smith has been adviser to the city of St. Louis on railroads, river and utility matters. He built a reinforced concrete river terminal, negotiated franchises and made valuations for settlement of railroads and electric railway difficulties, acted as an arbitrator in wage controversies and gave expert testimony in law suits. Among his specific accomplishments are the construction of a railway belt line around Oklahoma City, electrification of 20 miles of track in St. Louis for heavy electric locomotives and building of numerous bridges for the Texas & Pacific Railroad. While in the government service he supervised and advised upon much of the war-time construction, particularly on undertakings in the South and West.

Mr. Smith was born in Somerville, Mass., in 1877. He received the degree of bachelor of science in civil engineering from the Massachusetts Institute of Technology in 1900. His society membership includes the American Society of Civil Engineers and A.R.E.A. He belongs to the Engineers Club of St. Louis.

Status of Appointments to Ohio Commission

In a Senate caucus it was decided not to confirm the nomination by Gov. Vic Donahey of Walter McKinney for the third place on the Public Utilities Commission of Ohio. However, this action was not reported out on the floor of the Senate and no further action will be taken on the matter at once. The Senate previously had confirmed the Governor's appointment of James W. Huffman, his son-in-law and former secretary, and Judge William Klinger, Lima, to places on the commission. They succeeded George Poor and Charles C. Marshall, whose terms expired some time ago. George Mauller is the other member now serving on the commission. His term also expired some time ago.

C. C. Giles Resigns from Porto Rico Company

Carl C. Giles, for the last two years president and general manager of the Porto Rico Railway & Light Company, San Juan, P. R., has resigned and is returning north. In the short time he has been in charge Mr. Giles has worked wonderful changes in the service of the railway system. The new cars now in service were designed by him to meet tropical needs. Wages were increased, a pension fund and a sick benefit fund were established and bonuses were provided as rewards for particularly meritorious services. It is said that the passage of the Butler bill, which he believed added unnecessary burdens to doing business in Porto Rico, affected his decision about renewing his contract.

Changes in Rhode Island Personnel

Several changes affecting various departments were effective as of May 1 on the lines of the United Electric Railways, Providence, R. I.

Thomas E. Tefft has been elected comptroller to succeed George S. Hutchins, who has resigned.

Ralph E. Nock has been elected assistant comptroller, the position formerly held by Mr. Tefft and, in addition, will for the time being continue his present duties as office manager.

Ralph Gordon, who has been auditor

of property accounts, will assume the position of chief clerk, in the assistant comptroller's office, now held by Arthur E. Cawthorne, who has resigned.

Robert T. Watt will succeed Mr. Gordon as property clerk and will be in charge of property accounts.

Cecil E. Waldron, who has been chief clerk in the office of the superintendent of equipment, has been transferred to the accounting department and will be succeeded by J. Edward Shaw, now employed in the office of the superintendent of equipment.

Thomas G. Webber, who has served as electrical engineer in the office of Vice-President Slade, will assume general direction of the equipment department, as acting superintendent of equipment.

New Members of Indiana Commission in Office

The three new appointees to the Indiana Public Service Commission took their positions on May 1. The appointment of Calvin F. McIntosh, Worthington, and Harvey Harmon, Princeton, to be the Democratic members to succeed Frank Wampler and Clyde H. Jones, respectively, and the reappointment of Howell Ellis, Indianapolis, Republican, were announced by Governor Jackson after several days of consideration of the various applicants for the vacancies. Mr. McIntosh is a member of the federal board of vocational education. Mr. Harmon secured his appointment through the resignation of Mr. Jones and his term will expire May 1, 1929. Mr. Ellis was appointed to the commission in December of last year to fill a vacancy caused by resignation, and his term, as that of Mr. McIntosh, is for four years. Mr. Ellis had served as secretary of the commission for about eighteen months before his appointment to the body. He was a newspaper man before that, assigned to the statehouse for one of the Indianapolis papers.

Richard Siegmann, manager of the Städtische Strassenbahn, Rostock, has returned to Germany after a visit to the United States as a member of the delegation sent to this country to study traffic regulation. He visited New York, Washington, Philadelphia and Buffalo, in which he deemed conditions to be sufficiently representative to serve his purpose. He was especially impressed with the handling of rapid transit traffic on the lines of the Brooklyn-Manhattan Transit Corporation and the Interborough Rapid Transit Company. In an interview with a representative of the ELECTRIC RAILWAY JOURNAL he emphasized the fact that the German companies were quick to see the need for co-ordinating the railway and bus services and said he was struck by the evident extent to which this same trend was apparent in the cities that he visited here and in those about which he had obtained facts. He will report his findings to his own directors and also to Ludwig Spängler, director of the Städtischen Strassenbahnen at Wien and president of the Internationaler Strassenbahn und Kleinbahnverein.

Changes in Buffalo

M. L. Campbell New Interurban Manager, Succeeding Robert C. Larkin —New Incumbent Former Freight Conductor

M. L. Campbell

B. J. Yungbluth, president of the International Railway, Buffalo, N. Y., recently announced the appointment of Marcus L. Campbell, Lockport, as operating manager of the interurban division, effective on May 5. Mr. Campbell has been manager of the Lockport division since 1924. In his new position he will be responsible for service on the Buffalo-Niagara Falls high-speed line, the Buffalo-Lockport-Olcott division, the company's electric freight service, local service in the cities of Niagara Falls and Lockport, the Canadian Park and River division from Chippawa to Queenstown, and the Canadian side of Niagara's Great Gorge Trip.

The new manager entered the service of the company in 1922 as a freight conductor. His ability was quickly recognized. A year later he was made assistant superintendent of the Lockport division and in January, 1924, he became superintendent of that division. Less than two years later he was made freight traffic manager of the company. These two positions he held until his recent promotion.

R. C. Larkin

Mr. Campbell is well known in transportation circles on the Niagara Frontier and throughout the country, having been for some time with the Louisville & Nashville Railroad, the Washington Terminal Company and the American Railroad Association. He also is known for his service with the United States Marine Corps from 1913 to 1919, entering as a private under Gen. Smedley D. Butler and being discharged as captain. During this period he saw 5½ years of foreign service.

In commenting on the appointment, President Yungbluth said that Mr. Campbell's experience and ability have been valuable assets to the company.

Robert C. Larkin, Mr. Campbell's predecessor, was associated with Mitten Management for eight years. He spent four years as operating manager of the Darby, Media and Chester lines of the Philadelphia Rapid Transit Company in Philadelphia and for the past four years has been stationed at Niagara Falls, N. Y., as operating manager of the interurban lines of the International Railway. These include the Buffalo-Niagara Falls high-speed lines, Buffalo-Lockport & Olcott high-speed lines, all freight service, the local lines at Niagara Falls, N. Y.; Lockport, N. Y.; the Park & River division on the Canadian side; the Canadian portion of the Gorge Belt line, and the two international bridges.

Previous to that assignment Mr. Larkin was general manager of the Denver & South Platte Railway for seven years and served for twelve years with the Denver Tramway under the John A. Beeler management.

Broader Field of Safety for Victor T. Noonan

Victor T. Noonan, supervisor of accident prevention for the Chicago Surface Lines, Chicago, Ill., has resigned to become manager of the accident prevention department of the Chicago Motor Club. Mr. Noonan is going into a broader field of public safety work, in which he has already had a wide experience. For six years he was State Director of Industrial Safety in Ohio and afterward he organized the accident prevention work of the Cleveland Railway. In 1923 he became connected with the Chicago Surface Lines and installed a system of accident prevention which, since that time, has produced remarkable results. He established accident prevention committees in all departments, installed accident prevention suggestion boxes throughout the organization, conducted safety meetings for the trainmen and all employees at regular intervals and, to stimulate further the work, started an accident prevention contest in the train service.

Mr. Noonan was chairman of the general advisory council of the Chicago Surface Lines, which represented principal department heads. He was also a member of the Mayor's Safety Commission of the city of Chicago. He was chairman of the committee which had charge of safety during the Eucharistic Congress in Chicago and at present is chairman of the public safety committee of Metropolitan Chicago. He is a member of the board of directors of the Chicago Safety Council.

W. Kesley Schoepf Dead

Former Head of Cincinnati Traction Company Succumbs to Heart Disease at Age of 62—Noted Engineer Active in Railway Field in Many Cities—Organized Cincinnati Car Company

W. KESLEY SCHOEPF, president of the Cincinnati Car Company and former head of the Cincinnati Traction Company, died of a heart attack at his home in Cincinnati on May 6. He had been thought to be recovering from a recent attack of illness, but succumbed suddenly. Mr. Schoepf withdrew from active participation in the transportation field on Oct. 28, 1925, when he relinquished control of the railway in Cincinnati. He continued, however, as president of the Cincinnati Car Company, organized in 1913 to manufacture cars. At the time of his death he was also one of the directors of the Dalton Adding Machine Company and trustee and treasurer of the Hillsdale School for Girls.

Men of strong convictions and direct action like Mr. Schoepf are frequently misunderstood. That was his lot on several occasions, for it is a human failing to appraise by an incident rather than to take into account the acts of a lifetime. But it is by the acts of his lifetime that Mr. Schoepf must be adjudged, and by that token, however much he may have seemed to others at times to be in the wrong, he was a power for good. To few other men, if to any, is the debt of gratitude of Cincinnati greater. Many men now prominent in public life in the city owe their start to him. Acknowledgment to this end was made on the occasion of the banquet that he tendered to the veteran employees of the company when he formally withdrew from railway service in Cincinnati.

On this occasion much fuss rightly was made over the fact that Mr. Schoepf at his own expense presented a gold watch to each of 454 men as a token of his esteem. Naturally this was big news of its kind, the kind that cannot well be kept from the newspapers, but it represented only a tithe of the total of the generous, kindly things done unobtrusively by the man that endeared him to his immediate followers.

Career Started as Engineer

Quite naturally it was within Mr. Schoepf's power to have the material things that money will buy, but it is not platitudinous to say that among the possessions he prized most was the remembrance of the farewell banquet made permanent in the form of a book edited and published under the auspices of the Optimists' Club and the Queen City Club of Cincinnati. This is a work that will now be cherished more than ever by his associates and friends.

This man, who for more than 25 years presided over the railway at Cincinnati as its head, was without college training, but he was a man of liberal education. He was by profession a civil engineer. He had been chief engineer of the Rock Creek Railway, Washington, D. C. He was vice-president of the Eckington & Soldiers' Home Railroad and the Belt Railroad of Washington, D. C. He was general manager and chief engineer of the Columbia & Maryland Railroad, Baltimore, Md. In Pittsburgh he was vice-president and general manager of the Consolidated Traction Company. In Cincinnati he was president and chairman of the board of the Ohio Traction Company, which owned the stock of the Cincinnati Traction Company, the operating company in that city before it was succeeded by the Cincinnati Street Railway, with Walter A. Draper at its head, in the fall of 1925 on the occasion of Mr. Schoepf's withdrawal as an operating executive with the city system.

Mr. Schoepf arrived in Cincinnati from Washington, D. C., on Feb. 21, 1901, about the time that Hugh J. McGowan arrived from Indianapolis. Both were connected with the interests that had leased the electric railway system from the Cincinnati Street Railway. For the short time that Mr. McGowan was president of the company Mr. Schoepf served as chairman of the board. Soon afterward Mr. Schoepf became president of the company, representing the Widener-Elkins syndicate of Philadelphia.

W. Kesley Schoepf

During the 25 years Mr. Schoepf headed the electric railway system in Cincinnati he was, perhaps, more definitely in the public eye than any other man in the city. Electric railway men frequently are. He first delegated public relations work to the late Benson Foraker, son of Senator Foraker, and later to Walter A. Draper, both vice-presidents of the Cincinnati Traction Company. Each in his peculiar way possessed the faculty of turning away wrath. But the most unforgiving enemies of Mr. Schoepf do not deny that in the quarter of a century he made many real contributions to the welfare of the city.

One of these achievements was his part in the rescue of the Zoological Gardens from extinction. At the time he was induced to take hold the property was run down. The stock of animals was small and of scant variety and the attendance of the public decreasing. By hard work Mr. Schoepf brought the Zoo to its former renown and helped to advance it still further in reputation.

In 1903 Mr. Schoepf built the second skyscraper in Cincinnati, the Cincinnati Traction Building, the first being the Union Trust Building. He gave Cincinnati one of its large industries, the Cincinnati Car Company. He started the orphans' outings that have since been taken over by the Cincinnati Automobile Club and other organizations of a civic and professional nature.

In his long tenure as operating head of the railway the only serious conflict with employees was the strike of 1913. Personally his relations with the employees were friendly.

A District Loss to City

The place that he scored for himself was achieved by Mr. Schoepf by his keenness of brain, tireless energy and willingness to "play the game." He was both the doer and the dreamer, quick to translate thought into action, so quick at times that he confused his adherents at the very time he confounded his opponents. These characteristics of the man are reflected in the comment of the Cincinnati *Times* to the effect that:

> The sudden death of W. Kesley Schoepf removes from Cincinnati life one of its most interesting figures. For 25 years he had been constantly in the public eye as the head of the Cincinnati Traction Company. Naturally in the period of that organization's vicissitudes, the period of increasing car fares and decreasing car profits, he loomed large in popular discussion. He had battles to fight, and he fought them with vigor. He had contentions with citizen organizations, labor organizations, public officials and private interests. He asked no quarter and gave none. All in all, however, Mr. Schoepf was a many-sided man—a fast friend, a dauntless foe, a public-spirited citizen and a progressive man of affairs. He also was a patron of art and culture and a liberal steward in philanthropy. He contributed materially to Cincinnati's progression. Cincinnati regrets his going.

Marshall G. Linn, vice-president and general manager of the Des Moines Electric Light Company and the Iowa Power & Light Company, died in Des Moines recently. He first attracted notice in the railway field in 1917 when the railway at Bloomington was purchased and later combined with the Consumers Company by the late William B. McKinley. The combined property was placed in charge of Mr. Linn. Greater responsibility further developed his capabilities and his administration of the Bloomington company ranked with the most successful of any controlled by the Illinois Traction System. In Bloomington Mr. Linn was trained for greater opportunities and when the opening in Des Moines appeared he took charge of the affairs of the Des Moines Electric Light Company. With the formation of the Iowa Power & Light Company, after the company at Des Moines had been acquired by the present Illinois Power & Light Corporation, Mr. Linn was made vice-president and general manager.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Commercial Car Service Magazine

So that operators of commercial cars may have the benefit of Studebaker's extensive research and experimental work in the field of successful automobile operation and service, a commercial car edition of *Studebaker Service*, a monthly publication for the promotion of universally satisfactory service, has been announced by the Studebaker Corporation of America.

This new publication is devoted entirely to new and most efficient methods of insuring 100 per cent service from Studebaker commercial cars. It deals with every type of commercial car produced by Studebaker. It contains helpful information on the occasional service that is necessary to any automobile and how such service may be rendered in the most efficient manner.

In the first issue of the commercial car edition there is a wealth of material that will benefit the operator and the service manager who are interested in commercial cars. There are expert discussions of "How to Order Parts," "Care of Valves," "Bus Chassis Loads," "Ordering Bus Chassis Springs," "Touch Up Outfits for Lacquer," "Keeping Cars on the Road" and a number of other articles that contain valuable information.

2½-In. Paving Brick Again Recognized

Taking cognizance of an increase in shipments of 2½-in. paving brick from 31,802,533 in 1925 to 58,468,007 in 1926, the permanent committee on simplification of variety and standards for vitrified paving brick of the Department of Commerce of the United States, at its meeting in Washington March 31, reinstated this size in the list of recognized types and sizes.

The revised list of recognized types and sizes of vitrified paving brick as determined by the committee and the percentage of total shipments represented by each size is as follows:

	Per Cent
PLAIN WIRE-CUT BRICK	
2½-in. x 4-in. x 8½-in.	14.1
3-in. x 4-in. x 8½-in.	38.2
3½-in. x 4-in. x 8½-in.	5.9
REPRESSED LUG BRICK	
4-in. x 3½-in. x 8½-in. Wire-Cut L„	14.5
WIRE-CUT LUG BRICK	
4-in. x 3½-in. x 8½-in.	6.4
	79.1

NOTE.—Remainder of 20.9 per cent made up of special sizes or types not included in recognized list.

The survey of the industry, made by the United States Department of Commerce to serve as a basis on which the simplification committee annually makes its decisions, revealed a big increase in total shipments of paving brick for 1926 over 1925. Total shipments for 1925 were 353,588,777. Those for 1926 were 413,125,469, or a gain of 59,536,692 for last year. The 2½-in. brick was the only size showing a notable gain in percentage of total shipments, representing 8.9 per cent in 1925 and 14.1 per cent in 1926.

New Reo Line to Be Announced

Two new bus chassis are to be announced by the Reo Motor Car Company, Lansing, Mich. Because of the company's announced decision last January to discontinue bus bodies from the line and because right now the company is between "hay and grass" so far as old and new models are concerned, it has been rumored that Reo has abandoned the bus field. This the company denies. An announcement of interest will be made within the next few months. During the last four months Reo has gone right on delivering bus chassis. Greater Reo values and more advanced designs are ahead and a new field said to have been neglected until now by the bus manufacturers will be developed at the same time that Reo's present field is exploited.

Economic Conference Opens in Geneva

American Delegation Prepared to Help Europe, Not to Attempt to Tell It What to Do to Restore It to Full Industrial Vigor—Stout Defense, if Necessary, of Position of This Country

THE first four days of the International Economic Conference at Geneva, opened on May 4 with 47 countries, including Soviet Russia, represented by delegates, were devoted to a survey of the world's economic ills. There was general agreement that increased production was the indicated remedy, thereby increasing purchasing and consuming power and raising the standard of living. A striking note was the general solicitude for the well-being of workers, which was probably a new idea with European employers. In the opinion of W. T. Layton, editor of the *Economist*, a new equilibrium must be established, due, first, to the great increase of industrialization; second, to the fact that the United States is now a creditor nation, but apparently does not desire to buy from the countries she finances, contrary to the policies of former financing nations; third, to the decrease of European emigration; and, fourth, to the alteration of trade relations resulting from the payment of reparations and international war debts. The situation is more acute because Russian imports are small and Central Europe is divided by high tariff walls, resulting in duplication of industrial plants and preventing specialization, which is the essential feature of modern industrialism.

E. J. Mehren, in attendance at Geneva for the McGraw-Hill publications, cabled that Mr. Layton's insistence that the tariff walls of Central Europe must be lowered was approved by numerous speakers. There also was general approval of tariff stabilization regardless of the level, thus encouraging long-time contracts, uniform tariff classification and nomenclature. Long-time commercial treaties were advocated. There was no reference to American tariff rates, but several indirect references to our prohibition of immigration. Financing of backward countries was urged to stimulate production.

Dr. Carl F. Von Siemens of Germany criticised government intervention in industry, which was particularly interesting as coming from the representative of a country where government assistance and compulsion are considered normal. Zimmerman of Holland cited increased government services and restrictive labor legislation as increasing the industrial burden by raising prices, restricting consumption and reducing trade. The remedies suggested were removal of government interference and reduction in number of non-productive public servants. Only Shidachi of Japan and Layton of Great Britain cited the wastefulness of armaments.

The speech of Henry M. Robinson, chairman of the American delegation, was well received. He sketched the development of our prosperous industrial situation, stressing the determination of American employers to secure needed economies by better management and machinery, but not by wage reduction. He affirmed the American belief that competition stimulates industrial progress and suggested that the American delegation would probably disapprove of international cartels if governments participated or if they were exploitive in character. Answering Sir Max Muspratt of England, who thought that rubber restriction bore equally on every one, Mr. Robinson contented that there was discrimination against America, which uses 75 per cent of the output, as against only 7 per cent by Great Britain.

It is not expected that the conference will have great or important immediate results, but that it will contribute to a better understanding of international

Seeing Is Believing
Remember to have your exhibit at Cleveland, when the
A.E.R.A. Meets in October
Reserve Your Space
Between May 16 and June 15

problems and will lay a basis for some definite actions now and in the future. Three speakers advocated permanent organization for the study of international economic problems. The plenary sessions closed on May 7, and committee sessions on commerce, industry and agriculture began May 9.

Sokolnikoff of Russia painted an optimistic picture, declaring that industrial and agricultural production are now in excess of pre-war outputs, but the figures are doubted at Geneva. He made a plea for closer capital and trade relations, contending that the capitalist and socialist systems can work harmoniously together. He protested the boycott of Russia.

Obolenski Ossinski of Russia criticised the capitalist system severely, declaring it to be the cause of the World War. He condemned cartels and repeated Sokolnikoff's plea for trade relations, emphasizing the importance of the Russian market. In conclusion he offered eleven suggestions for restoring world trade and prosperity:

1. Cancellation of war debts.
2. Increase industrial wages.
3. Eight-hour day for all workers except miners, who should have six.
4. Fullest liberty for trade union organization and complete liberty for strikes.
5. Relief for the unemployed.
6. Raise funds for the unemployed by taxation.
7. Decrease unproductive expenditure, especially for armaments.
8. Abolish barriers against immigration.
9. Cancel protectorates and mandates and permit self-determination for all peoples.
10. No intervention in China.
11. Suspend economic boycott on Russia and extend credits to that country.

In a cable received from Mr. Mehren dated May 9 he refers to transactions in the various committees on commerce, industry and agriculture. Henry M. Robinson, the American member of the industry committee, told the delegates that there was no excuse for America to discuss general conditions except objectively. This was in response to doubts that American methods were suited to European conditions. Both questioners admitted that waste prevention and increased output were desirable and added that the interchange of methods and practice among industrial firms would be advantageous. The substitution of mechanical equipment for hand labor was considered not immediately possible due to extensive unemployment. Figures on the latter were considered uncertain, inasmuch as 1923 American estimates from two sources varied three million to five millions, with discrepancy not yet discovered. Peyerimhoff of the French coal mines committee eulogized the social harmony prevailing in America and requested information as to how this was obtained. He recognized the fact that class conflict is non-existent in America and showed an excellent understanding of American conditions. He said that Europe is seeking a cure for its ills by first obtaining financial stability.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	May 10, 1927
Copper, electrolytic, cents per lb.	12.775
Copper wire, cents per lb.	15.125
Lead, cents per lb.	6.73
Zinc, cents per lb.	6.50
Tin, Straits, cents per lb.	68.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	2.175
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–20
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.625

† Quotations withdrawn because of strike

Copper, at 13 Cents, Comes to Life—Other Non-Ferrous Metals Quiet

COPPER sold in large volume during the week ended May 11, 1927, with prices almost uniformly at a firm 13 cents delivered basis, says *Engineering and Mining Journal.* Little business was reported in tin and lead was only moderately active. Zinc was in good demand and exhibits a somewhat stronger tendency than lead, in spite of a further reduction in ore prices at Joplin. The platinum market continues demoralized, with further important reductions in price.

With large buying by the leading consuming interest, copper became suddenly active on May 6 and a good business followed, though on May 11 there was perhaps a little cessation in the inquiry. Most of the buying has been by consumers in the East, including an occasional order from a wire mill, and the price has been almost uniformly 13 cents delivered. In the Middle West an occasional order has been placed at 13⅛ cents, but sellers have found a disinclination to pay that much, and it seems likely that copper—perhaps Michigan copper—has been offered to Middle Western consumers at close to 13 cents. There is some talk of advancing quotations to Eastern consumers to 13⅛ cents, but apparently no one has yet taken that step.

Most of the orders placed have been for June shipment, with a liberal quantity for July, and an occasional request for May and August. All are quoted at the same price. Foreign business has picked up markedly, and the export association has been limiting the amount sold. The export price is unchanged at 13.33 cents, c.i.f.

The zinc market has been more active than for seven weeks with practically all business at either 6⅛ or 6.15 cents, St. Louis, though some was sold as low as 6.10 cents. Zinc generally is in strong hands. Though stocks increased last month, it is felt that production will be curtailed to accord with the demand, especially now that ore in the Tri-State district has dropped below $40 a ton, and that further price reductions are unlikely.

Statistics of the American Zinc Institute, in tons of 2,000 lb., follow:

Stock, April 1	36,279
Produced	51,626
Shipped	46,697
Stock, April 30	41,208
Shipped from plant for export	1,876
Total retort capacity, April 30	136,644
Number idle retorts available within 60 days	57,297
Average number of retorts operating during April	81,582
Number retorts operating April 30	81,096

Little change had taken place in prices for lead in either the foreign or domestic markets during the week ended May 11. The American Smelting & Refining Company maintained its official contract price at 6.75 cents, New York, and 6.40 cents was the prevailing figure in the St. Louis market. Occasional lots were sold at prices from 2½ to 5 points below these, but the total tonnage at cut rates was not large. Despite the fact that Mexican ore lead is all going abroad, prices in London have been well maintained. A significant feature in the domestic market is that practically all of the moderate volume of business is for May shipment. This indicates "hand-to-mouth" buying in an unusual degree and suggests that one of the periodic buying waves may start if and when consumers reach the conclusion that the bottom of the market has been reached. On May 11 600 tons of antimonial lead arrived in New York from the Burma mines in India. It is believed that this is low-grade material sent here for refining.

On May 5 it developed that very little Straits tin for prompt shipment was available in the domestic market. The price jumped more than a cent, though it was largely nominal. Subsequently some consumers postponed delivery on early contracts, thereby releasing sufficient nearby metal to supply the meager requirements of consumers. The spread between Straits and 99 per cent is particularly wide because of the fact that an ample supply of the lower grade metal from England is afloat.

$200,000 Bus and Rail Terminal in Michigan City

Contracts have been awarded for the construction of the new union passenger station to be used jointly by the Chicago, South Shore & South Bend Railroad and the Shore Line Motor Coach Company, a subsidiary, at Michigan City, Ind. The cost of the station, together with an adjoining garage which will accommodate 40 motor coaches, will be more than $200,000. It will be a two-story structure with offices for operating officials of the motor coach company on the second floor.

Additional ground near the station has been purchased to provide loading facilities for the motor coaches. A steel-covered canopy will be built leading from the station and covering one-half of the loading area to protect passengers in case of inclement weather.

The interior of the station will be tastefully decorated and comfortably furnished. Adequate accommodations for refreshments will be provided through the installation of a counter where light lunches and drinks will be served. The front of the building will have two large full-length plate-glass windows on either side of a double door.

Because of a special arrangement by

which Shore Line Motor Coach passengers may ride on the high-speed trains of the South Shore Line between Michigan City and Chicago—at their option—Michigan City has become an important transfer point. Motor coaches of the Carey and Leach Bus Lines, Inc., operating between Detroit and Chicago, also will use the new station as their Michigan City headquarters.

The station will be built by the J. H. Lorenz Company, Gary, Ind., and the garage is under construction by the Austin Company, Chicago.

Fifteen New Cars Urged by San Francisco Citizens

Various civic organizations are now behind the movement for the immediate purchase of fifteen cars for the new Judah Street line of the Municipal Street Railway, San Francisco, the money for which would be taken from a $290,000 budget item for track. In a sense this reopens a matter referred to previously in the ELECTRIC RAILWAY JOURNAL. Back of the movement is Mayor Rolph, who is understood to have agreed to ask the Board of Supervisors to divert from other city funds for the time being the money for the new rolling stock.

Meanwhile delivery of the fifteen cars ordered eight months ago will be completed during the next three weeks.

Virginia Company Rushing Trackwork

Virginia Electric & Power Company is reported as assembling material for the double tracking of its Bay Shore line in Tidewater, Virginia. It is understood also that the company expects to begin work on this improvement and on the construction of the Church Street track, between Eighteenth and 25th Streets, as soon as the Naval Base line has been revamped.

While work on the Bay Shore line will be in full swing this summer, it appears now almost certain that the double track will not be completed until fall and that the heavy summertime traffic to and from Ocean View, seaside resort, will move this year, as it has in the past, over the present main line through Norfolk and Bay View.

With an even break on the weather, completion of the new track on 25th Street and Hampton Boulevard, which will shorten considerably the running time to the Naval Base, is expected before the battle and scouting fleets come to Hampton Roads for their week's visit on May 28.

Rolling Stock

El Paso Electric Company, El Paso, Tex., has placed an order with the American Car Company, St. Louis, for seven 39-ft. 11½-in. single-end motor bodies to be mounted on Brill 177-EX trucks.

Interstate Public Service Company, Scottsburg, Ind., recently placed an order for six interurban cars with the G. C. Kuhlman Car Company. The new cars will be mounted on Brill 177-EX trucks.

Montreal Tramways, Montreal, Canada, received its first new Versare bus May 4, according to advices from the office of D. E. Blair, general superintendent. Tests of the new equipment will go forward immediately.

Galveston Electric Company, Galveston, Tex., has placed an order for four 44-ft. 11½-in. double-end bodies to be mounted on Brill 177-EX trucks.

Brazilian Traction, Light, Heat & Power Company, with offices in Toronto, Ont., is reported as having placed an order for cars with the Canadian Car & Foundry Company of Montreal, Canada. In some quarters this is taken as indicative of active South American trade with the Canadian industry.

Track and Line

Public Service Railway, Newark, N. J., will lay new rails and roadbed along Cass Street, Trenton, N. J.

Pennsylvania & New Jersey Railway, Morrisville, Pa., will extend its lines from Trenton and Morrisville, Pa., to Manor Park and along the Delaware River front.

Atlantic City & Suburban Railway, Atlantic City, N. J., has been requested by the Atlantic County Board of Freeholders to bring its roadbed up to grade along the shore road.

Utah Light & Traction Company, Salt Lake, Utah, is reported as contemplating the expenditure of $350,000 for repairing, replacing rails, new overhead work and new equipment.

Los Angeles Railway, Los Angeles, Cal., has started work on complete reconstruction of tracks on West Washington Street between Estrella and Burlington. The old 60-lb. rail formerly used will be replaced by the new, heavy 116-lb. steel girder rail, of which the first 550-ton unit of a 2,000-ton order placed by the company arrived in Los Angeles harbor on board the S.S. *Felix Taussig*, May 7. This new rail is not only a great improvement from the standpoint of efficient operation, but also is a long step toward smoother and more comfortable riding for the passengers. Replacement of the old rail is also being made on Figueroa Street, between Eleventh and Washington.

Milwaukee Electric Railway and Light Company, Milwaukee, Wis., will spend nearly $800,000 this year in reconstructing tracks and paving in Milwaukee and suburbs, according to a recent announcement by R. H. Pinkley, vice-president. About $35,000 has been spent at Broadway and East Wisconsin Avenue. Two jobs are now under way; one on 35th Street from Wells to State Street, which is estimated to cost $25,000; the second on National Avenue from 22d to 24th Avenue. Other projects scheduled are: Twenty-fifth Street, Clybourn to Park Hill, $38,500; Juneau Avenue, Third to Seventh Street, $30,800; East Water Street, Michigan to Mason, $25,200; Kinnikinnic Avenue, Falling Heath to Ludlow, $38,000; Third Street between Center and Burleigh, $32,000; Center Street, Third to Eighth, pavement only, $15,500.

Shops and Buildings

Indiana Service Corporation, Fort Wayne, Ind., is rumored as having plans drawn for a $250,000 terminal building and offices at Fort Wayne, Ind. The structure is to be built of brick, concrete and steel.

Trade Notes

American Brass Company, New York City, opened an office in the Military Park Building, Newark, N. J., May 2. J. B. Benedict and L. B. Smith are in charge.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been granted permission by the Trenton City Commission to lay a double track on Princeton Avenue.

Van Dorn Coupler Company, Chicago, Ill., reports the recent sale of 400 couplers to the Philadelphia Rapid Transit Company and the placing of an order for 302 couplers for the company's new subway cars.

Moloney Electric Company, St. Louis, Mo., a subsidiary of American Brown Boveri Electric Corporation, New York City, will shortly occupy its new plant in St. Louis, which will permit of increased output to meet its present bookings.

Detroit Stoker Company, Detroit, Mich., announces the appointment of A. Kastello as district sales representative for its eastern Canada and Montreal, Que., territories, with headquarters at 915 New Birks Building, Montreal. Mr. Kastello is a well-known Canadian engineer, having served for many years with different railways in Canada in the capacity of mechanical engineer and power plant efficiency engineer.

New Advertising Literature

Economy Electric Devices Company, Chicago, Ill., is featuring its Economy meters in the four-page folder which is a reprint of an advertisement which appeared in ELECTRIC RAILWAY JOURNAL March 19, 1927.

Acme Electric Heating Company, Boston, Mass., has published a new catalog, series C, complete and revised and possessed of valuable information in the electric heating and resistor field.

Smith Welding Equipment Corporation, Minneapolis, Minn., announces the issuance of its new 1927 junior catalog. It is a convenient pocket size edition, giving prices on and illustrating oxy-acetylene equipment.

Samuel Cupples Envelope Company, New York City, is distributing a circular containing samples of its various envelope products. The mailing piece is especially designed for the convenience of the purchasing agent.

Roller-Smith Company, New York, manufacturer of electrical measuring and protective apparatus with works at Bethlehem, Pa., has recently issued two loose-leaf bulletins describing its type FR relays and type HTD d.c. voltammeters.

When your shoe-string breaks

"PEACOCK"
Reg. U. S. Pat. Off.
STAFFLESS

The string in your right shoe always breaks when time presses. The quickest way out is another pair of shoes—and you have them.

When through a combination of misfortunes the air brakes turn tail the motorman on nearly every modern car swings into action with the "PEACOCK" STAFFLESS BRAKE. It is as reliable as that emergency-meeting pair of shoes—there when you need it and positive in its effect.

NATIONAL BRAKE COMPANY, Inc.
890 Ellicott Square, Buffalo, N. Y.—Canadian Representative, Lyman Tube & Supply Co., Ltd., Montreal

One of the 70 motor coaches of the Kansas City Public Service Company, all equipped exclusively with Goodyear Pneumatic Cord Bus Tires

GOODYEAR

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A Million Tire Miles a Month on Goodyears

All 70 motor coaches of the Kansas City Public Service Company, covering more than a million tire miles a month and carrying a half million passengers monthly, are equipped exclusively with Goodyear Pneumatic Cord Bus Tires.

The experience of the Company includes the best performance of many makes of tires, but since October last Goodyears alone have been used in this service.

The Company's routes, with their many hills, and its operating requirements, with their many stops and starts, impose a severe duty on the tires. In this service, the Company's own records show why Goodyear Tires have this preference above all tires.

* * *

No less than 25 Goodyears in the service of the Kansas City Public Service placed an average of 28,114 miles to their credit on the traffic records. Ten other Goodyears ran an average of 28,721 miles.

A Goodyear Pneumatic, on Bus No. 159, has traveled 43,446 miles, and is still in service. Another went 40,204 miles before being replaced. A third, 36,283 miles; a fourth, 33,995 miles, and a fifth, 32,869 miles. The general average of all Goodyear Tires in this service shows a Goodyear *always* gives a good account of itself.

* * *

Goodyear Pneumatic Bus Tires deliver a high standard of long-mileage, trouble-free tire performance at a low cost per tire mile.

Made with the famous All-Weather Tread, they possess great tractive power and provide an extra measure of security under all conditions.

Made with SUPERTWIST, the extra-elastic, extra-durable cord fabric developed by Goodyear for Goodyear Tires, they give long, economical wear.

Only Goodyear Tires are made with the All-Weather Tread and with SUPERTWIST casings. Only Goodyear Tires, therefore, can give you the advantages of SUPERTWIST and the All-Weather Tread. Yet they cost you no more.

For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service

BUS TIRES

Made with SUPERTWIST

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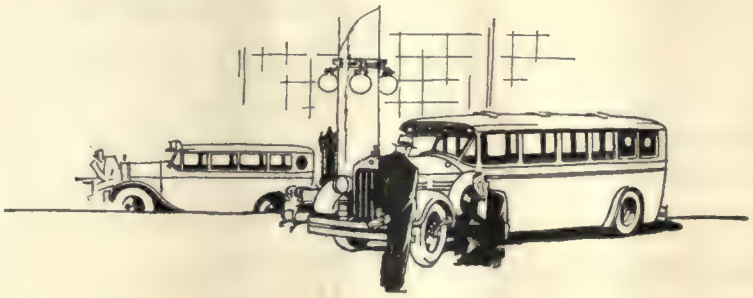
ONE buys an untried wheel—a wheel that *looks* right and *sounds* reasonable—but he doesn't *know* whether he's getting a wheel that will keep his jobs on the road, or in the repair shop.

THE OTHER buys Budd-Michelin—a wheel that has twelve years of *actual road experience* built into it; a wheel that is keeping 100,000 buses and trucks running on schedule—he *knows* what he will get.

Who is the better buyer?



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Interior of one of the new Eastern Texas Interurban Cars, showing the installation of our No. 11-F.

JUST WHAT THEY WANTED!

THE Eastern Texas Interurban Company was looking for an unusual seat—one that would afford more seating capacity and comfort in a minimum amount of space.

They found just such a seat in the new Heywood-Wakefield 11-F (shown above). This new unit, adapted to interurban and long-distance use, actually affords greater comfort and seating capacity in the shortest over-all length of any seat now on the market. The padded backs are pitched at a restful angle. The deep, roomy seats have comfy spring cushions over our specially built-up construction and the underframe of the seat is of durable pressed steel.

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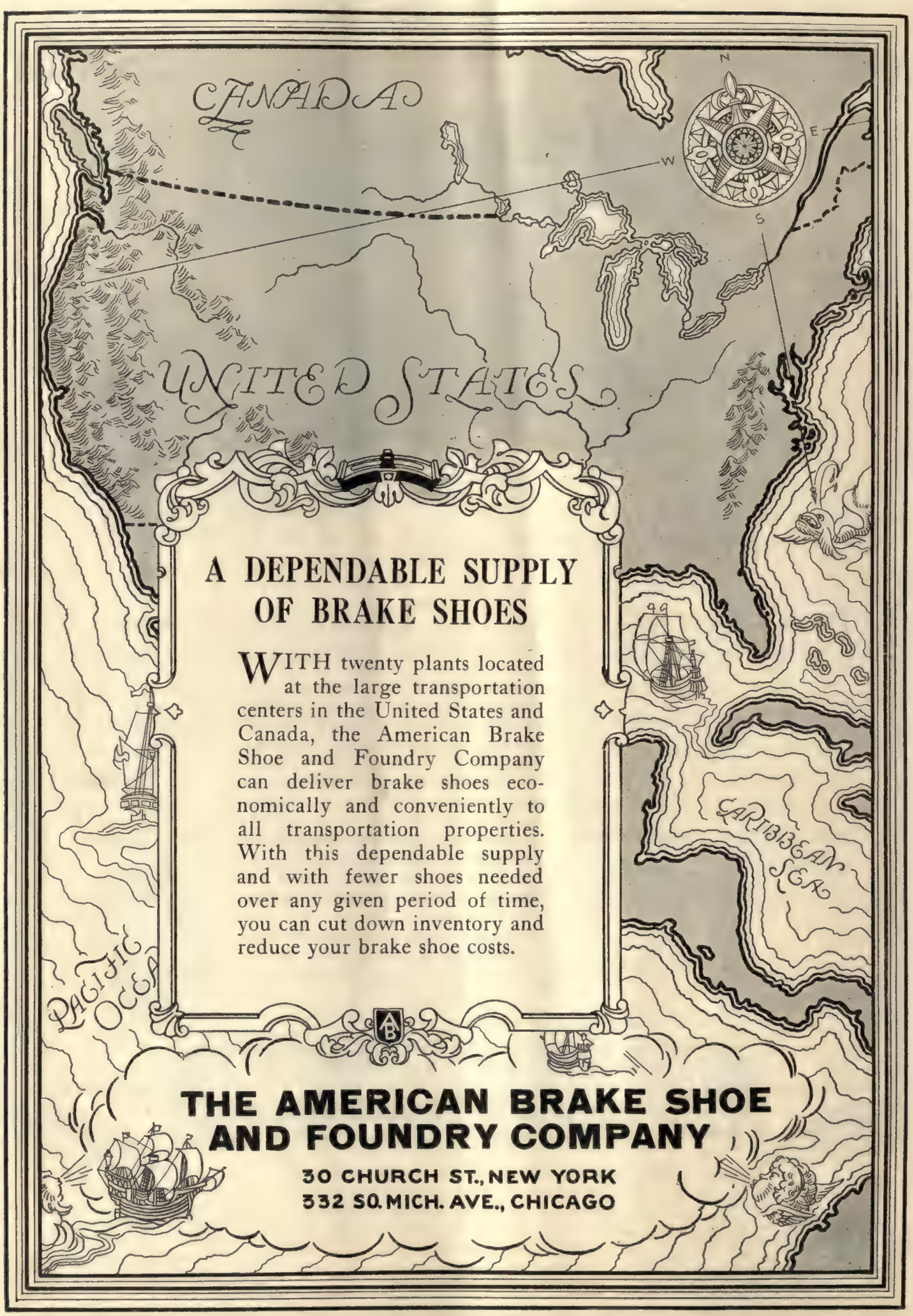

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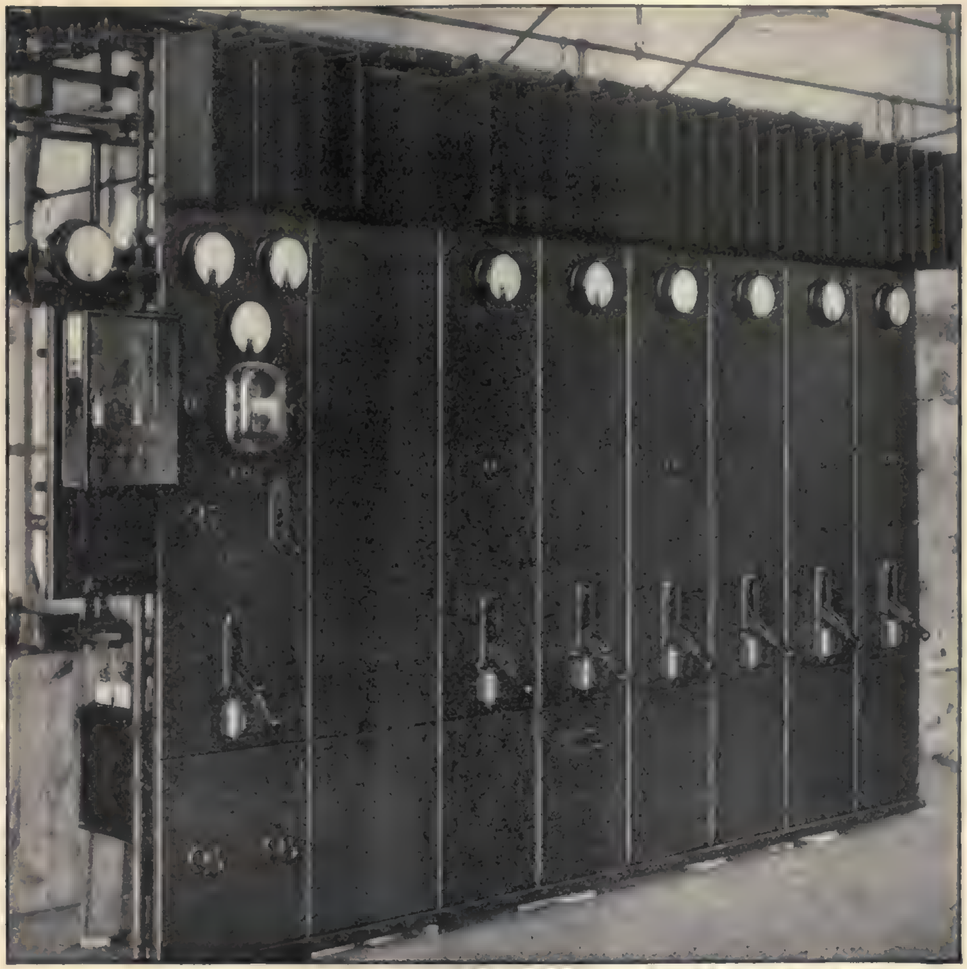
Asbestos Ebony



Asbestos Ebony Switchboard at Hotel Del Monte, Monterey, Cal., erected by Westinghouse Electric and Mnfg. Co., of Emeryville, California.

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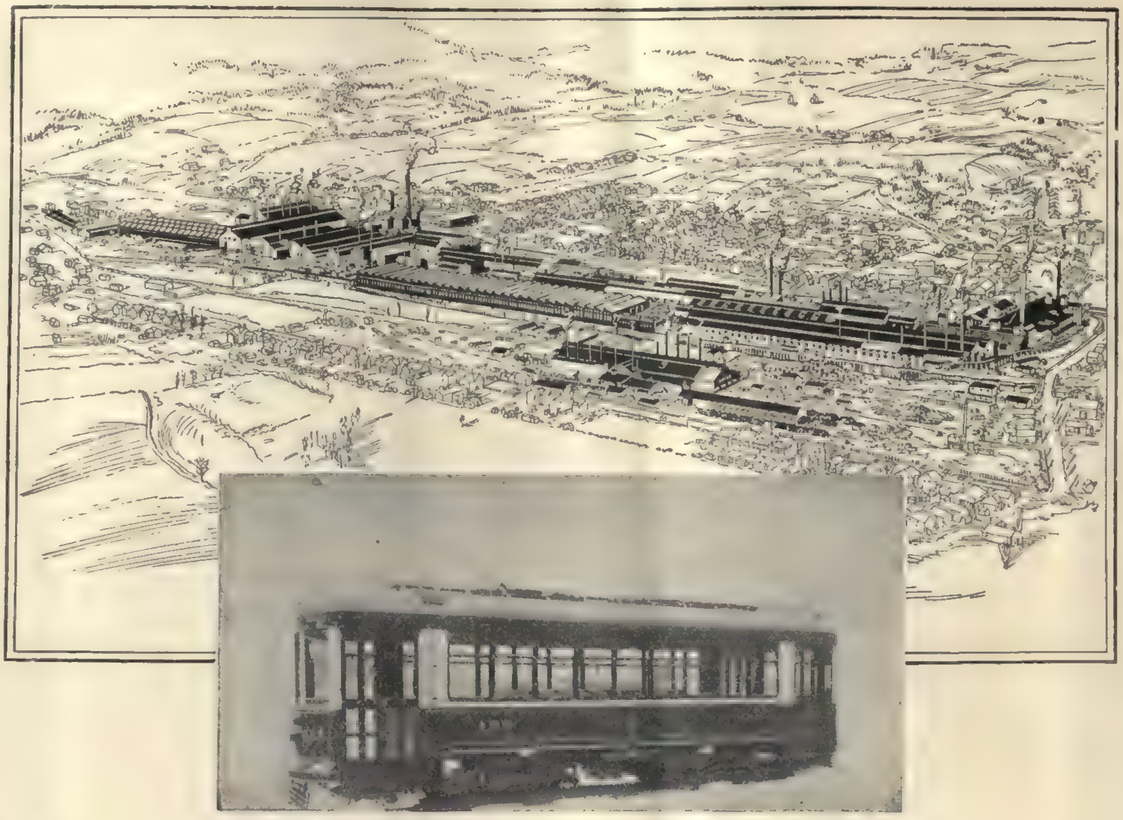

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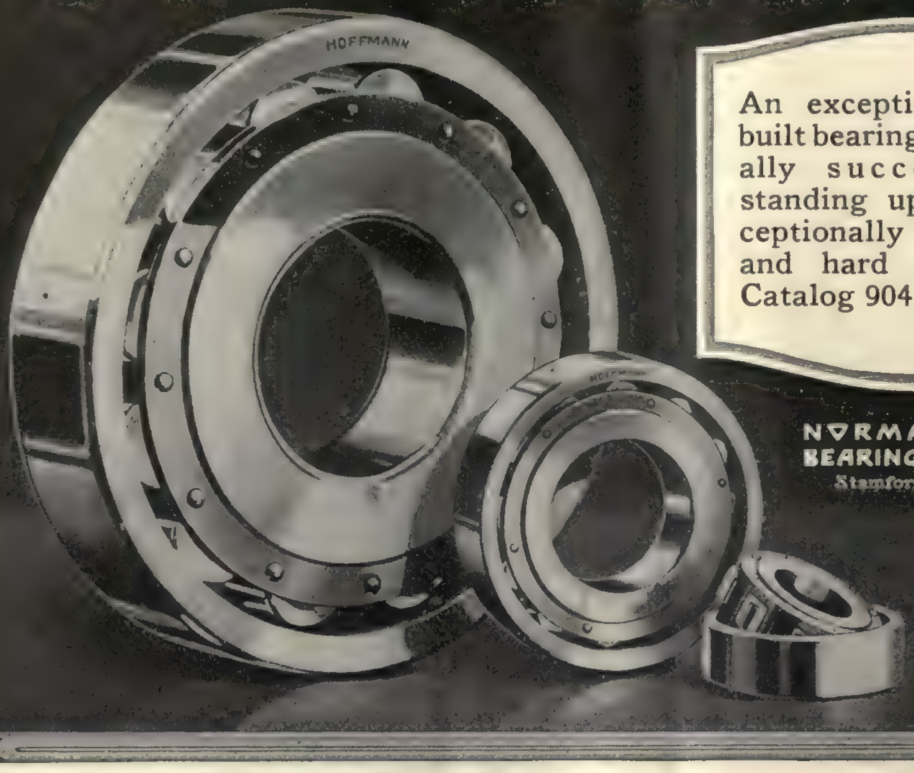

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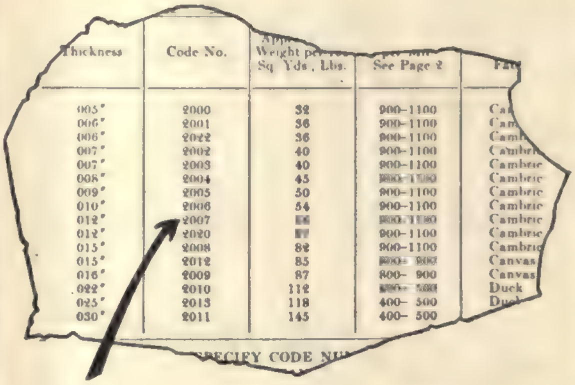

Thickness	Code No.	Appr… Weight pe… Sq. Yds., Lbs.	…per Mil… See Page 2	Fa…
005"	2000	32	900–1100	Ca
006"	2001	36	900–1100	Cam
006"	2022	36	900–1100	Camb
007"	2002	40	900–1100	Cambri
007"	2003	40	900–1100	Cambric
008"	2004	45	[illegible]	Cambric
009"	2005	50	900–1100	Cambric
010"	2006	54	900–1100	Cambric
012"	2007	[illegible]	[illegible]	Cambric
012"	2020	[illegible]	900–1100	Cambric
015"	2008	82	900–1100	Cambric
015"	2012	85	[illegible]	Canvas
016"	2009	87	800– 900	Canvas
.022"	2010	112	[illegible]	Duck
025"	2013	118	400– 500	Duc
030"	2011	145	400– 500	

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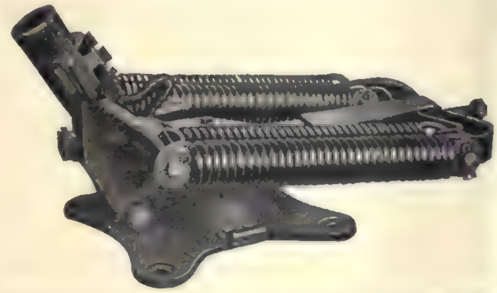

You doubtless could if you knew what grade of metal to put in the foot, the swivel, the pole socket, etc.—if you knew where they had to be reinforced to withstand strains and where they had to be lightened to keep down weight; if you knew a reliable foundry that could furnish suitable castings; if you had $60,000 worth of special machinery, tools, jigs, reamers, drills, etc., but even so, if you didn't have 35 years of experience and a crew of skilled mechanics you couldn't *equal* a Nuttall Trolley. So why should you think anyone else could?

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ENGINEER, 10 years' experience in design and operation of railway and power equipment, desires position with railway or power company with opportunity for advancement; Middle West preferred. PW-997, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

MR. MANAGER. If you are not satisfied with earnings, operating costs, efficiency, co-operation of employees and general conditions. If you have an opening or contemplate changes in your organization, a reply to this advertisement will place you in contact with a superintendent transportation, with broad experience, successful record, recognized ability, fine references, fully capable of getting results you desire. Correspondence and interviews invited and treated confidentially. PW-6, Electric Railway Journal, Guardian Building, Cleveland, Ohio.

POSITIONS WANTED

EQUIPMENT superintendent in the maintenance of all types of electric cars and buses, who has and can show results, desires for personal reasons to make a change. PW-5, Electric Railway Journal, Tenth Ave. at 36th St. New York.

GENERAL manager available, Technical graduate, broad experience both city and interurban, also light and power properties. Excellent record in straightening out labor difficulties, maintaining harmony and reducing operating costs. Particularly successful in public relations work. PW-3, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

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Graduate Electrical Engineer, at present employed with nationally known corporation, desires, for personal reasons, to make new connection.

Nine years' practical railway experience, and seven years' sales experience in electrical equipment. Particularly adapted to railway supply line. Age 36, married. Prefer New York or vicinity. Excellent references.

AS-994, Electric Railway Journal,
Tenth Ave. at 36th St., New York City.

Representatives Wanted

TO SELL A NEW BEARING METAL

with a potential sale of 100 million dollars per annum. We want live organizations or capable individuals who know the railroad, street railway, steel plant, machine shop, mining and similar industries.

A national advertising campaign is starting immediately and exclusive territories are open.

BROOKE ANDERSON, Inc.

First National Bank Building, Chicago, Ill.

Sacrificing Used Railway Equipment

BIRNEY CARS

4—32 seating capacity, Westinghouse 508-A motors, fully equipped. Splendid condition.

SWEEPERS

1—Double truck snow sweeper, fully equipped.
1—McGuire single truck snow sweeper, fully equipped.

ROTARY CONVERTERS

500 Kw., 600 volt D.C., 430 volt A.C., 6 ph., 25 cy. Can be inspected in operation.

All of this equipment is in excellent condition and presents a buying opportunity that enables you to secure equipment for which there is an everyday need, at prices that mean great savings.

WRITE OR WIRE FOR OUR PRICES

We purchase railways in their entirety and are especially equipped to do our own dismantling.

Send us details of what you have and we will arrange to make an inspection and give you our best proposition.

ROTARY CONVERTERS

1,000 Kw., 600 volt D.C., 430 volt A.C., 6 ph., 25 cy. Excellent operating condition.

TOWER TRUCK

1—2½-ton White Tower Truck McCardle three section tower, electric starter and lights. Fully equipped. New 1923.

BUSSES

2—Studebaker, Parlor Car, 15 passenger. Year 1926. In good condition.

H. E. SALZBERG CO., Inc., 50 Church St., New York City

POSITIONS WANTED

(Continued from opposite page)

GENERAL superintendent, technical and practical, competent and successful; fifteen years' experience; salary five thousand dollars. PW-1000, Electric Railway Journal, Tenth Ave. at 36th St., New York.

MASTER mechanic of character and ability, 20 years' experience on city and interurban property, desires to make a change for personal reasons. Best of references, correspondence solicited. PW-993, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

PRESENT superintendent of railway property operating 30 cars and 10 buses, desires change. Practical experience in each of its departments. Best of references. Correspondence solicited. PW-4, Electric Railway Journal, Tenth Ave. at 36th St., New York.

RAILWAY executive, now employed, desires change; fifteen years' experience on property operating 75 cars; university graduate. PW-999, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

SUPERINTENDENT of railways with 20 years' experience, desires for personal reasons to make change. Nationwide reputation as railway operator, can take full charge. Has ability to handle men and show results. Correspondence invited and treated in confidence. PW-979, Electric Railway Journal, 7 South Dearborn Street, Chicago, Ill.

TRANSPORTATION superintendent, at present engaged in the East, desires to locate in Middle West; 23 years' experience. Age 44. References. PW-1, Electric Railway Journal, Tenth Ave. at 36th St., New York.

REPRESENTATIVE WANTED

Sales Representative

A long established company, marketing mechanical devices with modern sales methods, desires a man as sales representative. We feel that the proper man should be from 35 to 40 years old. Our products are sold to mechanical departments of railroads and the successful applicant should have mechanical background, preferably in connection with rolling stock. Our products, as a type, might be classified along with side bearings, draft gear, car roofing, etc., although they resemble none of these. The man who can qualify will be compensated on a salary basis plus traveling expenses. The territory is principally east of Buffalo and north of Washington, with headquarters in New York area. Reply in detail, giving past connections and where now employed. State age, and salary expected. All replies treated in confidential manner. RW-7, Electric Railway Journal, Tenth Ave. at 36th Street, New York.

FOR SALE

Registering Turn Stiles

Two right hand and two left hand operating. Used only 21 days. Made by H. V. Bright. In excellent operating condition.

NORTHERN STATES POWER CO.
Fargo & Moorhead Division
Fargo, North Dakota

TO HELP YOU

LOCATE BUSINESS OPPORTUNITIES

"Searchlight" Advertising

G-1

NEW AND RELAYING RAILS

Tie Plates
—Switches—Frogs
—Portable Track
Finest Quality
Flat Cars—Locomotives
Quick Delivery *Lowest Price*

HYMAN-MICHAELS CO.
People Gas Building
St. Louis CHICAGO San Francisco

SPECIAL PRICE
on 7 single truck
BIRNEY CARS

Good condition. Equipped with Westinghouse 508 motors, for double end operation. $1500.00 each.

IRVING S. VAN LOAN CORPORATION,
1750 Broadway, New York City.

FOR SALE

15 BIRNEY SAFETY CARS

Brill Built
West. 508 or G. E. 264 Motors
Cars Complete—Low Price—Fine Condition

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

WANTED

LANG QUALITY

The same Lang quality that we build into new Lang bus bodies goes into the work of

REBUILDING, PAINTING & SERVICING

any bus body in our shops. We will be glad to furnish estimates on Lang quality work for your buses.

THE LANG BODY COMPANY - Cleveland, Ohio

WANTED

MOTORS

12 — 40 General Electric 203-A, 203-B or 203-P Motors without control equipment or trucks.

Cumberland County Power & Light Company
Portland, Maine

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.
Air Brakes
Westinghouse Air Brake Co.
Air Receivers & Aftercoolers
Ingersoll-Rand Co.
Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M Co.
Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.
Automatic Regulator, Voltage, Current & Synchronizing
American Brown Boveri Elec. Corp.
Automatic Return Switch Stands
Ramapo Ajax Corp.
Automatic Safety Switch Stands
Ramapo Ajax Corp.
Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
St. Louis Car Co.
Standard Steel Works
Westinghouse E. & M. Co.
Axles, Steel
Carnegie Steel Co.
Babbitting Devices
Columbia Machine Works & M. I. Co.
Badges and Buttons
Elec. Service Supplies Co.
International Register Co.
Bankers and Engineers
Public Service Engineering Bureau
Batteries, Dry
Nichols-Lintern Co.
Bearings, Ball
Norma-Hoffman Bearing Co.
Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.
Bearings, Center and Roller Side
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A
Bearings, Roller
Norma-Hoffman Bearing Co.
Bells and Buzzers
Consolidated Car Heating Co.
Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
St. Louis Car Co.
Benders, Rail
Railway Trackwork Co.
Bodies, Bus
Brill Co., The J. G
Lang Body Co.
St. Louis Car Co.
Body Material, Haskelite and Plymetl
Haskelite Mfg. Corp.
Boilers
Babcock & Wilcox Co.
Bolts and Nuts, Track
Illinois Steel Co.
Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.
Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co
Bonds, Rail
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co
Westinghouse E. & M. Co.
Book Publishers
McGraw-Hill Book Co.
Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)
Bates Expanded Steel Truss Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.
Brake Adjusters
Brill Co., The J. G
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.
Brake Lining, Asbestos
Johns-Manville Corp.

Brake Shoes
American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
Brake Testers
National Ry. Appliance Co.
Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
National Brake Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.
Brakes, Magnetic Rail
Cincinnati Car Co.
Brushes, Carbon
General Electric Co.
Jeandron, W. J.
LeCarbone Co.
Westinghouse E. & M. Co.
Brushes, Wire, Pneumatic
Ingersoll-Rand Co.
Brushholders
Columbia Machine Works
Building Materials, Fireproof
Johns-Manville Corp.
Bulkheads
Haskelite Mfg. Corp.
Bus Lighting
National Ry. Appliance Co.
Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
St. Louis Car Co.
Cables (See Wires and Cables)
Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.
Carbon Brushes (See Brushes, Carbon)
Car Lighting Fixtures
Elec. Service Supplies Co.
Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse E. & M. Co.
Car Steps, Safety
Cincinnati Car Co.
Irving Iron Works
Car Wheels, Rolled Steel
Bethlehem Steel Co.
Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.
Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.
Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.
Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co
St. Louis Car Co.
Cars, Second Hand
Electric Equipment Co.
Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.
Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Castings, Gray Iron and Steel
American Brake Shoe & Fdry. Co.
American Steel Foundries
Bemis Car Track Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Standard Steel Works
Castings, Malleable & Brass
American Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas N.

Catenary Construction
Archbold-Brady Co.
Ceiling Car
Haskelite Mfg. Corp.
Ceilings, Plywood, Panels
Haskelite Mfg Corp.
Cements, High Temperature
Johns-Manville Corp.
Chairs, Parlor Car
Heywood-Wakefield Co.
Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.
Change Trays
Cincinnati Car Co.
Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.
Circuit Breakers, Oil
American Brown Boveri Elec. Corp.
Clamps and Connectors for Wires and Cables
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.
Clusters and Sockets
General Electric Co
Coil Banding and Winding Machines
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
Coils, Armature and Field
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.
Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Coin Changers
Illinois Motive Equip. Co.
Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.
Coin Sorting Machines
Cleveland Fare Box Co.
Coin Wrappers
Cleveland Fare Box Co.
Commutator Slotters
Columbia Machine Works
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.
Commutator Truing Devices
General Electric Co
Commutators or Parts
Cameron Electrical Mfg Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E & M. Co.
Compounds, Insulating
Johns-Manville Corp.
Compressors, Air
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr Br Co.
Compressors, Air Portable
Ingersoll-Rand Co.
Condensers
General Electric Co.
Ingersoll-Rand Co.
Westinghouse E. & M. Co.
Condensor Papers
Irvington Varnish & Ins. Co.
Conduit Duct Underfloor
Johns-Manville Corp.
Conduits, Fibre
Fibre Conduit Co.
Johns-Manville Corp.
Connectors, Solderless
Westinghouse E. & M. Co.
Connectors, Trailer Car
Columbia Machine Works
Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.
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Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.
Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.
Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.
Copper Wire
American Brass Co
American Steel & Wire Co.
Anaconda Copper Mining Co.
Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
Anaconda Copper Mining Co.
Cord, Bell, Trolley, Register
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebling's Sons Co., John A.
St. Louis Car Co.
Samson Cordage Works
Silver Lake Co.
Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.
Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.
Cowl Ventilators
Nichols-Lintern Co.
Cranes, Hoists & Lifts
Electric Service Supplies Co.
Cross Arms (See Brackets)
Crossing Foundations
International Steel Tie Co.
Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Crossings, Track (See Track Special Work)
Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.
Curtains & Curtain Fixtures
Brill Co., The J. G.
St. Louis Car Co.
Dealer's Machinery & Second Hand Equipment
Electric Equipment Co.
Hyman-Michaels Co.
Lang Body Co.
Salzberg Co., Inc., H. E
Derailing Devices (See also Track Work)
Derailing Switches
Ramapo Ajax Corp.
Destination Signs
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
Detective Service
Wish-Service, P. Edward
Door Operating Devices
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.
Doors & Door Fixtures
Brill Co., The J. G.
Cincinnati Car Co.
General Electric Co.
Hale-Kilburn Co.
St. Louis Car Co.
Doors, Folding Vestibule
National Pneumatic Co.
Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Ingersoll-Rand Co.
Ohio Brass Co.
Dryers, Sand
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Ears
Columbia Machine Works & M. I. Co.
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Electric Grinders
Railway Trackwork Co.
Electric Rivet Heaters
American Car & Fdry. Motors Co.

Electrical Wires and Cables
Amer. Electrical Works.
American Steel & Wire Co.
John A. Roebling's Sons Co.
Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.
Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.
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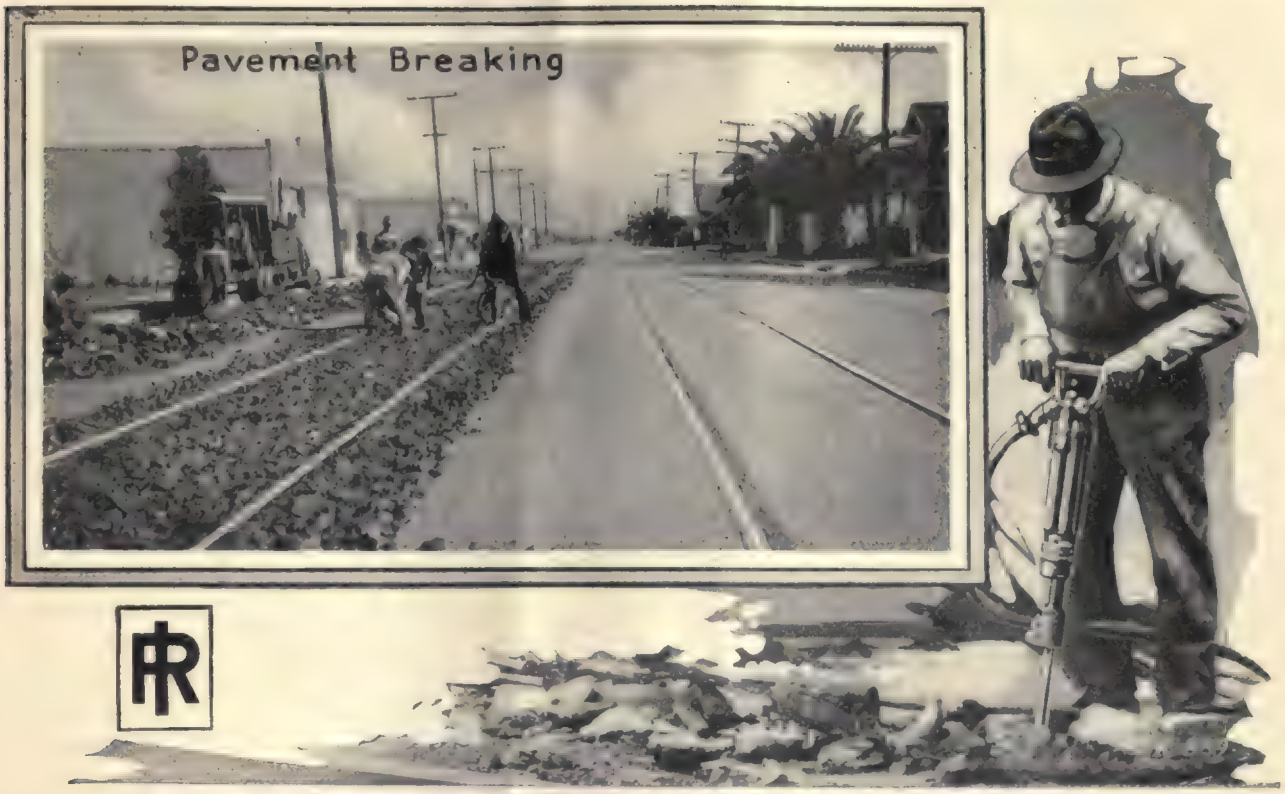
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layng Corp.
Byllesby Co., H. M.
Day & Zimmermann, Inc.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
Linn & Marshall Co.
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster Co.
White Eng. Corp., The J. G.
Engines, Gas, Oil or Steam
Ingersoll-Rand Co.
Westinghouse E. & M. Co.
Exterior Side Panels
Haskelite Mfg. Corp.
Fare Boxes
Cleveland Fare Box Co.
Illinois Motive Equip. Co.
Perey Mfg. Co.
Fare Registers
Electric Service Supplies Co.
Ohmer Fare Register Co
Fences, Woven Wire & Fence Posts
Acme Wire Co.
American Steel & Wire Co
Fenders and Wheel Guards
Brill Co., The J. G
Cincinnati Car Co
Consolidated Car Fender Co
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.
Fibre and Fibre Tubing
Westinghouse E. & M. Co
Field Coils (See Coils)
Flangeway Guards, Steel
Godwin Co., W. S.
Floodlights
Electric Service Supplies Co
Floor, Sub
Haskelite Mfg. Corp.
Flooring, Fireproof
Irving Iron Works
Flooring, Monolithic
Johns-Manville Corp.
Flooring, Non-Slipping
Irving Iron Works
Flooring, Open Steel
Irving Iron Works
Flooring, Steel Subway
Irving Iron Works
Flooring, Ventilating
Irving Iron Works
Floors
Haskelite Mfg. Corp
Forgings
Brill Co., The J. G.
Cincinnati Car Co.
Standard Steel Works
Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co
Frogs, Track (See Track Work)
Frogs, Trolley
Electric Service Supplies Co
Ohio Brass Co.
Westinghouse E. & M. Co
Fuses and Fuse Boxes
Columbia Machine Works & M. I. Co.
Consolidated Car Heating Co
General Electric Co.
Westinghouse E. & M. Co.
Furnaces, Electric
American Brown Boveri Elec. Corp.
Fuses, Refillable
General Electric Co.
Gaskets
Westinghouse Tr. Br Co
Gaskets, Asbestos
Johns-Manville Corp.
Gas Producers
Westinghouse E. & M Co
Gates, Car
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.
Gauges, Oil and Water
Ohio Brass Co.
Gear Blanks
Brill Co., The J. G.
Standard Steel Works
Gear Cases
Chillingworth Mfg. Co
Columbia Machine Works & M. I. Co.
Electric Service Supplies Co
Westinghouse E. & M. Co.

(Continued on page 42)

I-R Portable Air Power Units



Pavement breaking at a fraction of the cost of hand work

Records of many jobs on different roads show that Ingersoll-Rand Paving Breakers, operated from the I-R Portable Compressors, have reduced the cost of concrete breaking by at least one half as compared to hand methods.

An outfit consisting of Ingersoll-Rand tools and a portable compressor proves a great laborsaver for railway companies. The compressor can be used to operate not only concrete breakers, but I-R pneumatic tie tampers, rail drills, rock drills, sand blasts, paint sprays, riveters, etc.—all important labor and time savers.

INGERSOLL-RAND COMPANY-11 BROADWAY, NEW YORK CITY.
Offices in principal cities the world over
FOR CANADA REFER-CANADIAN INGERSOLL-RAND CO. LIMITED, 260 ST. JAMES STREET, MONTREAL, QUEBEC.

73-PC

Ingersoll-Rand

Gears and Pinions
- Bemis Car Truck Co.
- Columbia Machine Works & M. I. Co.
- Electric Service Supplies Co
- General Electric Co.
- Nat'l Ry. Appliance Co.
- R. D. Nuttall Co.

Generating Sets, Gas-Electric
- General Electric Co.

Generators
- American Brown Boveri Elec. Corp.
- General Electric Co.
- Westinghouse E. & M. Co.

Girder Rails
- Bethlehem Steel Co.
- Lorain Steel Co.

Gongs (See Bells and Gongs)

Grating, Steel Subway
- Irving Iron Works

Greases (See Lubricants)

Grinders, Portable
- Ingersoll-Rand Co.
- Railway Trackwork Co.

Grinders, Portable Electric
- Railway Trackwork Co.

Grinding Bricks and Wheels
- Railway Trackwork Co.

Guard Rail Clamps
- Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
- Ramapo Ajax Corp.
- Wm. Wharton, Jr. & Co.

Guards, Trolley
- Elec. Service Supplies Co.
- Ohio Brass Co.

Hammers, Pneumatic
- Ingersoll-Rand Co.

Hand Holds
- Central Equipment Co.

Harps, Trolley
- Columbia Machine Works
- Elec. Service Supplies Co.
- R. D. Nuttall Co.
- Star Brass Works

Headlights
- Elec. Service Supplies Co.
- General Electric Co.
- Ohio Brass Co.
- St. Louis Car Co.

Headlining
- Columbia Machine Works & M. I. Co.
- Haskelite Mfg. Corp.

Heaters, Bus
- Nichols-Lintern Co.

Heaters, Car (Electric)
- Consolidated Car Heating Co.
- Gold Car Heat. & Ltg. Co.
- Railway Utility Co.
- Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
- Smith Heater Co., Peter

Heaters, Car Stove
- Smith Heater Co., Peter

Heaters, Electric Rivet
- American Car & Fdry. Motors Co.

Helmets, Welding
- Railway Trackwork Co.
- Una Welding & Bonding Co.

Hoists & Lifts
- Columbia Machine Works & M. I. Co.

Hoists, Portable
- Ingersoll-Rand Co.

Hose, Bridges
- Ohio Brass Co.

Hose, Pneumatic
- Westinghouse Traction Brake Co.

Instruments, Measuring, Testing and Recording
- American Steel & Wire Co.
- General Electric Co.
- National Ry. Appliance Co.
- Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
- General Electric Co.
- Irvington Varnish & Ins. Co.
- Okonite Co.
- Okonite-Callender Cable Co.
- Westinghouse E. & M. Co.

Insulating Silk
- Irvington Varnish & Ins. Co.

Insulating Varnishes
- Irvington Varnish & Ins. Co.

Insulation (See also Paints)
- Electric Ry. Equipment Co.
- Elec. Service Supplies Co.
- General Electric Co.
- Irvington Varnish & Ins. Co.
- Okonite Co.
- Okonite-Callender Cable Co.
- Westinghouse E. & M. Co

Insulation, Paper & Boiler
- Johns-Manville Corp.

Insulation Slots
- Irvington Varnish & Ins. Co.

Insulator Pins
- Elec. Service Supplies Co.
- Hubbard & Co.

Insulators (See also Line Materials)
- Elec. Ry. Equipment Co.
- Elec. Service Supplies Co.
- General Electric Co.
- Irvington Varnish & Ins. Co.
- Ohio Brass Co.
- Westinghouse E. & M. Co.

Interior Side Linings
- Haskelite Mfg. Corp.

Interurban Cars (See Cars)

Jacks (See also Cranes, Hoists and Lifts)
- Buda Co.
- Columbia Machine Works & M. I. Co.
- Elec. Service Supplies Co.

Joints, Rail (See Rail Joints)

Journal Boxes
- Bemis Car Truck Co.
- Brill Co., The J. G.
- Cincinnati Car Co.
- St. Louis Car Co.

Lamp Guards and Fixtures
- Elec. Service Supplies Co.
- General Electric Co.
- Westinghouse E. & M. Co.

Lamps, Arc & Incandescent (See also Headlights)
- General Electric Co.
- Westinghouse E. & M. Co.

Lamps, Signal and Marker
- Elec. Service Supplies Co.
- Nichols-Lintern Co.
- Ohio Brass Co.

Lanterns, Classification
- Nichols-Lintern Co.

Letter Boards
- Cincinnati Car Co.
- Haskelite Mfg. Corp.

Lighting Fixtures, Interior
- Electric Service Supplies Co.

Lightning Protection
- Elec. Service Supplies Co.
- General Electric Co.
- Ohio Brass Co.
- Westinghouse E. & M. Co.

Line Material (See also Brackets, Insulators, Wires, etc.)
- Archbold-Brady Co.
- Electric Ry. Equipment Co.
- Elec. Service Supplies Co.
- General Electric Co.
- Hubbard & Co.
- Ohio Brass Co.
- Westinghouse E. & M. Co.

Locking Spring Boxes
- Wm. Wharton, Jr. & Co.

Locomotives, Diesel Electric
- American Brown Boveri Elec. Corp.

Locomotives, Electric
- American Brown Boveri Elec. Corp.
- Cincinnati Car Co.
- General Electric Co.
- St. Louis Car Co.
- Westinghouse E. & M. Co.

Locomotives, Oil Engine, Electric Driven
- Ingersoll-Rand Co.

Lubricating Engineers
- Universal Lubricating Co.

Lubricants, Oil and Grease
- Universal Lubricating Co.

Manganese Parts
- Bemis Car Truck Co.

Manganese Steel Guard Rails
- Ramapo Ajax Corp.
- Wm. Wharton Jr. & Co.

Manganese Steel, Special Track Work
- Bethlehem Steel Co.
- Wm. Wharton, Jr. & Co.

Manganese Steel Switches, Frogs and Crossings
- Bethlehem Steel Co.
- Ramapo Ajax Corp.
- Wm. Wharton, Jr. & Co.

Meters (See Instruments)

Mirrors, Inside & Outside
- Cincinnati Car Co.

Motor and Generator Sets
- American Brown Boveri Elec. Corp.
- General Electric Co.

Motor Buses (See Buses)

Motors, Electric
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(Continued on page 45)

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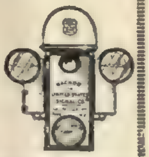

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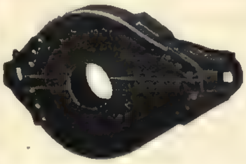

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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page

A

Acme Wire Products.......... 33
American Brake Shoe & Foundry Co. 26
American Brass Co., The...... 44
American Brown Boveri Electric Corp. 16-17
American Car Co..........46-47
American Car & Foundry Motors Co. ....Front Cover
American Electrical Works..... 43
American Steel Foundries...... 6
American Steel & Wire Co..... 38
Anaconda Copper Mining Co.... 44
Archbold-Brady Co........... 37

B

Babcock & Wilcox Co........ 37
Bates Expanded Steel Truss Co. 44
Beeler Organization 36
Bemis Car Truck Co.......... 43
Bethlehem Steel Co........... 38
Brill Co., The J. G...........46-47
Brooke Anderson, Inc........ 38
Buda Co., The................ 38
Buchanan & Layng Corp. 36
Budd Wheel Co............... 24
Byllesby Engineering & Management Corp................ 36

C

Cameron Electrical Mfg. Co.... 44
Cameron Steam Pump Works, A. S. 41
Carnegie Steel Co........... 32
Central Equipment Co........ 34
Chillingworth Mfg. Co........ 44
Cincinnati Car Co..........14-15
Cleveland Fare Box Co........ 37
Collier, Inc., Barron G........ 30
Columbia Machine Works, The. 32
Consolidated Car Fender Co.... 44
Consolidated Car Heating Co.... 37
Cumberland County Power & Lt. Co. 39

Page

D

Day & Zimmermann, Inc...... 36
Dayton Mechanical Tie Co...... 18
Differential Steel Car Co., The.. 43

E

Electric Equipment Co........ 39
Electric Ry. Equipment Co.... 43
Electric Service Supplies Co.... 9

F

Ford, Bacon & Davis......... 36
"For Sale" Ads............... 39

G

General Electric Co........... 20
Godwin Co., W. S............. 43
Goodyear Tire & Rubber Co..22-23
Gold Car Heating & Ltg. Co... 44

H

Hale-Kilburn Co. 37
Haskelite Mfg. Corp....Back Cover
Heywood-Wakefield Co......... 25
"Help Wanted" Ads.......... 39
Hemphill & Wells 36
Holst, Englehardt W......... 36
Hubbard & Co. 44
Hyman-Michaels Co........... 39

I

Illinois Motive Equipment Co.. 37
Illinois Steel Co.............. 31
Ingersoll-Rand Co. (A. S. Cameron Steam Pump Wks.).... 41
International Register Co...... 37
International Steel Tie Co., The. 7
Irving Iron Works Co......... 35
Irvington Varnish & Insulator Co. 37

Page

J

Jackson, Walter 36
Jeandron, W. J.............. 34
Johns-Manville Corp.......... 27

K

Kelker, DeLeuw & Co......... 37
Kuhlman Car Co...........46-47

L

Lang Body Co.....Insert 11-12, 39
LeCarbone Co. 34
Linn & Marshall, Inc.......... 36
Lorain Steel Co.............. 34

M

Massachusetts Mohair Plush Co. 29
McClellan & Junkersfeld 36
McGraw-Hill Book Co......... 33
Metal & Thermit Corp......... 10

N

Nachod and U. S. Signal Co.... 44
National Brake Co., Inc...... 21
National Pneumatic Co........ 13
National Ry. Appliance Co.... 34
Naugle Pole & Tie Co........ 44
Nichols-Lintern Co........... 43
Norma-Hoffman Bearings Corp.. 32
Northern States Power Co...... 39
Nuttall Co., R. D............. 35

O

Ohio Brass Co............... 5
Okonite-Callender Cable Company, Inc., The............. 43
Okonite Co., The............. 43

Page

P

Perey Mfg. Co., Inc.......... 44
Positions Wanted and Vacant... 39
Public Service Engineering Bureau 36

R

Railway Track-work Co....... 4
Railway Utility Co........... 44
Ramapo Ajax Corp........... 43
Richey, Albert 36
Roebling's Sons Co., John A.... 44

S

St. Louis Car Co............. 19
Salzberg Co., Inc., H. E........ 39
Samson Cordage Works........ 44
Sanderson & Porter 36
Searchlight Section 38, 39
Silver Lake Co............... 43
Smith Heater Co., Peter....... 44
Standard Steel Works Co...... 28
Star Brass Works............ 34
Stevens & Wood, Inc......... 36
Stone & Webster 36
Stucki Co., A................ 44

U

Una Welding & Bonding Co.... 37
Universal Lubricating Co...... 38

W

"Want" Ads 39
Wason Mfg. Co.............46-47
Westinghouse Electric & Mfg. Co. 2
Westinghouse Traction Brake Co. 8
Wharton, Jr. & Co., Inc. Wm. 34
"What and Where to Buy," 40-42-45
Wish Service, The P. Edw.... 37
White Eng. Corp., The J. G.... 36
Wood Co., Chas. N. 44

WHAT AND WHERE TO BUY—Continued from page 42

Ties, Wood Cross (See Poles, Ties, Posts, etc.)

Tires
Goodyear Tire & Rubber Co.

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Wheels, Car, Steel & Steel Tire
American Steel Foundries
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Carnegie Steel Co.
Illinois Steel Co.
Standard Steel Works

Wheels, Steel Disc
Budd Wheel Co.

Wheels, Trolley
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General Electric Co.
R. D. Nuttall Co.
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Acme Wire Co.
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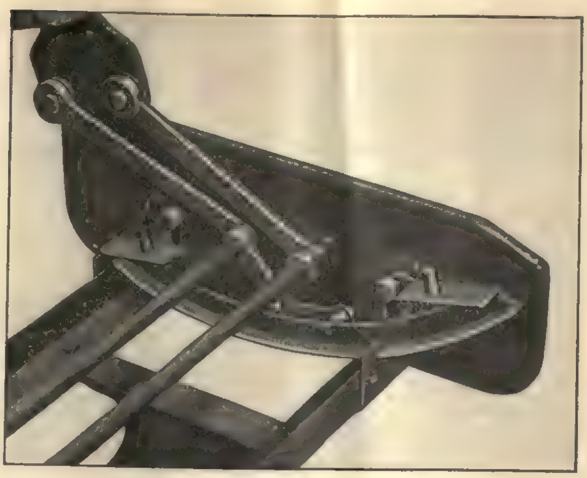


Standard mechanism which features Brill Modern Reversible Car Seats

No. 201-B2

No. 201-B

No. 201-D

Positive reversing action features
Brill Car Seats

Much of the success of Brill modern car seats is due to the positiveness of their reversing mechanism. In the first place, the two seat rockers supporting the cushion are of rolled steel T-section. This not only indicates strength, but along with a particular simplicity has a tendency to reduce wear to a minimum. These T-section rockers are held firmly in place and move to the reverse position only with the action of the aisle and wall arms, to one of which on each side they are directly connected by a cam and link arrangement. To this direct connection, as well as the simplicity and durability of the mechanism, the positiveness and efficiency of the reversing action of Brill modern car seats is attributed.

No. 202-B1

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

The Type of Car, and the Future—

New Brill Modern Cars

equipped with

Brill No. 177-E Trucks
Brill No. 201 Reversible Seats
Brill "Renitent" Post Casings
Brill Vertical Handle Brakes
Brill Exhaust Ventilators
Brill "Dedenda" Alarm Gongs

now operated by

The Potomac Edison Co.
Cumberland, Md.

Realizing that the type of rolling stock operated is an important factor in their future success hundreds of electric railways have already displaced heavy and comparatively obsolete cars with new light-weight equipment, the type which not only saves but earns by attracting increased revenue passengers.

It is a proven fact that the key to future electric railway success is the type of rolling stock operated. Brill modern cars are particularly designed to eliminate unnecessary operating expense and at the same time meet the requirements of modern public transportation.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MANF'G CO.
ST LOUIS MO — CLEVELAND OHIO. — SPRINGFIELD, MASS.

HASKELITE ROOFS

"—to reduce our operating expense"

THE Southern Ohio Public Service Company (Day & Zimmerman, Inc., Management) has operated 20 one-man safety cars on its Zanesville, Ohio, city line since 1925, which were manufactured by the Kuhlman Car Company and equipped with HASKELITE molded roofs, including the hoods, and PLYMETL sides.

Note the letter from John W. Hewitt, General Superintendent.

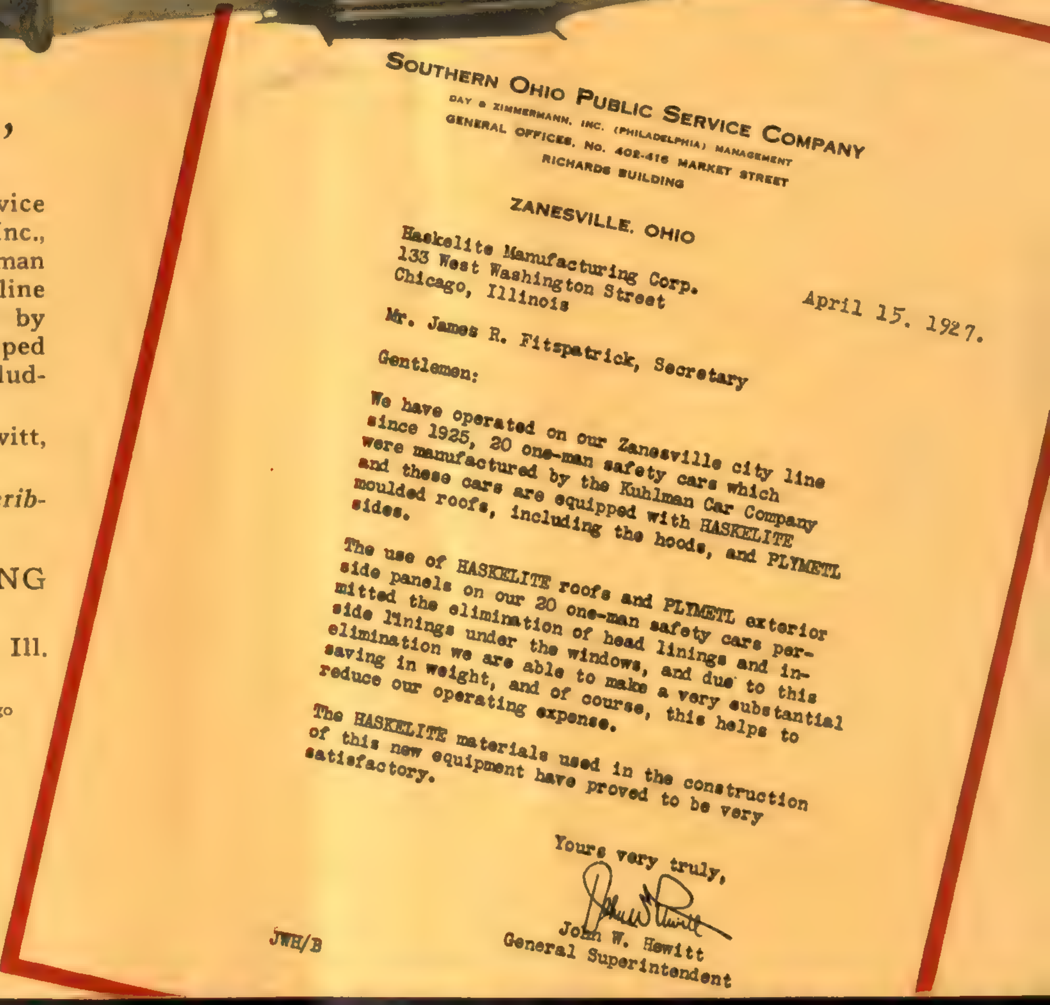
Ask for detailed blueprint booklet describing this money-saving construction.

HASKELITE MANUFACTURING CORPORATION
133 West Washington Street, Chicago, Ill.

Railway Representatives:
Economy Electric Devices Co., 37 W. Van Buren St., Chicago
Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.
George E. Watts, 1523 Candler Bldg., Atlanta, Ga.
Railway & Power Engineering Corp., Toronto, Ont. Canada

PLYWOOD
HASKELITE
PLYMETL

ERJ5-14-Gray



SOUTHERN OHIO PUBLIC SERVICE COMPANY
DAY & ZIMMERMANN, INC. (PHILADELPHIA) MANAGEMENT
GENERAL OFFICES, NO. 402-416 MARKET STREET
RICHARDS BUILDING

ZANESVILLE, OHIO

Haskelite Manufacturing Corp.
133 West Washington Street
Chicago, Illinois

April 15. 1927.

Mr. James R. Fitzpatrick, Secretary

Gentlemen:

We have operated on our Zanesville city line since 1925, 20 one-man safety cars which were manufactured by the Kuhlman Car Company and these cars are equipped with HASKELITE moulded roofs, including the hoods, and PLYMETL sides.

The use of HASKELITE roofs and PLYMETL exterior side panels on our 20 one-man safety cars permitted the elimination of head linings and inside linings under the windows, and due to this elimination we are able to make a very substantial saving in weight, and of course, this helps to reduce our operating expense.

The HASKELITE materials used in the construction of this new equipment have proved to be very satisfactory.

Yours very truly,

John W. Hewitt
John W. Hewitt
General Superintendent

JWH/B

PLYMETL SIDE PANEL

MAINTENANCE AND CONSTRUCTION ISSUE

aw-Hill Publishing Company, Inc. May 21, 1927 Twenty Cents per Cop

ELECTRIC RAILWAY JOURNAL

predominance

Mitchell Ave.
Cincinnati

East Hunter Street
Atlanta

Two More Cities in the 200,000 Class Go To Twin Ties

THE overwhelming predominance of Steel Twin Tie Construction in those 33 cities in the United States of over 200,000 population is rapidly increasing.

With the track construction season just opened, two new users have been added in the heavy traffic class, the class where the test of paved track quality is most severe.

The installation of Twin Tie Track Construction in Cincinnati and Atlanta is another tribute to the permanence, durability and economy of Steel Twin Ties. This same construction will often cost less than *your* present construction. Be sure to get delivered prices and the man-hour estimate sheet to use with your local costs for estimating your paved track work.

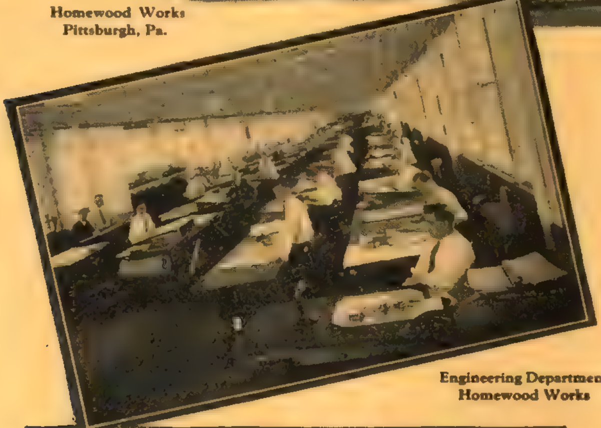
The International Steel Tie Co.
Cleveland, Ohio

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track

W
WESTINGHOUSE ELECTRIC

Homewood Works
Pittsburgh, Pa.



Engineering Department
Homewood Works

Inspection Department
Homewood Works

Westinghouse Warehouse
Chicago, Ill.

A Good Renewal Part
is the
First Step
to
Lower Maintenance

RENEWAL parts made by the original manufacturer are designed to produce the best performance from the entire unit.

The ultra-modern Westinghouse Homewood Works was built to facilitate the production of quality parts at the lowest possible cost to the user.

It is backed up by an engineering and experimental department who are constantly striving to increase the life of renewal parts and improve the performance of apparatus.

Special attention is paid to the inspection of renewal parts to insure that every part is interchangeable with the old part.

With the Westinghouse policy of carrying ample stocks in all the twenty-seven district warehouses, renewal parts can be obtained as required.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse

X92758

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AMERICAN ELECTRIC RAILWAY ASSOCIATION
AERA
1927

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Vol. 69
No. 21
Pages 891-936

CONTENTS

MAY 21, 1927

Editorials 891

Housing Type Bearing Adapted to Axles 894
Wedge type axle bearings used by the Third Avenue Railway, New York City, make accurate fits easy to obtain, and wear, with its resulting noise and trouble, is reduced.

Overhead Fixtures Inspected on a Car-Pass Basis in Cleveland 896
BY ANGUS SCOTT.

Handling Armatures on Monorail System 897

Maintaining Proper Gear-Center Distances 899
BY P. A. PONTIUS.
With modern types of railway motors there are ten surfaces where wear will cause spreading of gear centers. The minimum desirable wear for these surfaces are given.

Figures Corrected 902

Depot Car Attracts Travel 902

Cincinnati Is in Midst of Intensive Reconstruction Program 903
Terms of new franchise necessitated considerable track reconstruction. Co-operation between the city and railway facilitates progress. Elimination of noise and riding comfort are given careful consideration.

Safety Guards in Wilkes-Barre & Hazleton Shops .. 906
Study of working conditions resulted in the design and installation of an elaborate system of shrouds for moving parts.

Many Accident Hazards in Car Operation 907

The Readers' Forum 908

I. R. C. Cleans Up and Paints Up 908

Adventures of Old Man Trouble 909

The Judges Who Will Officiate in the Maintenance Competition 910

Maintenance Data Sheet 911

Modern Equipment 915

Dick Prescott 917

Association News and Discussion 918

American Association News 920

News of the Industry 921

Recent Bus Developments 927

Financial and Corporate 931

Personal Mention 932

Manufactures and the Markets 933

A New Form for a Vital Purpose

FOLLOWING a careful study for several months of every detail of car equipment, the JOURNAL recently mailed out a new car equipment blank. A supply of the revised form is being sent to the officials of every street railway in this country and it is earnestly requested that use be made of the revised blanks in reporting all pending car orders, and also new rolling stock already delivered within the past three months.

Though an attempt has been made to cover every equipment device now serving the field, the compilers will welcome additions to the list and also criticism of the present set-up. To take care of such contingencies, additional space has been provided in the "Remarks" column.

One hundred per cent co-operation is requested in reporting new car equipment, not only from the standpoint of news but as a means of compiling statistics on this most vital factor of the industry.

Five minutes of your time in this particular means invaluable statistics at the end of 1927.

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Advertising Index—Alphabetical, 78; Classified, 74, 76, 78; Searchlight Section, 73

SAVING THE RAIL SAVES THE RAILWAY

Eternal Vigilance

Eternal vigilance is the price of good service. Unless this price is paid, depreciation exacts a much greater toll. Especially true is this as applied to track maintenance.

Owning modern grinders and arc welders, and keeping them everlastingly busy is the cheapest form of track maintenance—and the most effective.

If you don't want to damage your whole track foundation, you must remove corrugations and repair low joints before they pound the track and the cars to pieces.

Here is the equipment for that job.

Have you bulletins? Have you quotations? Hurry? Wire! Or phone.

Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

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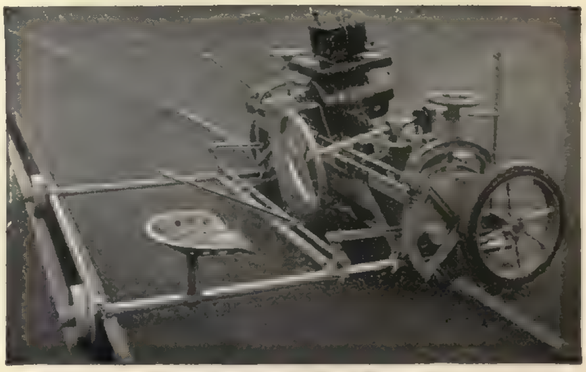
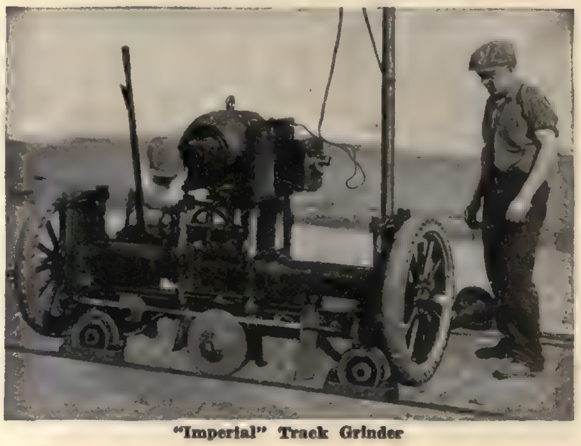
1817

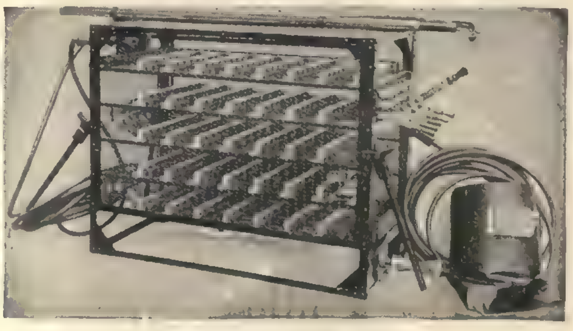


"Improved Atlas" Rail Grinder



"Imperial" Track Grinder

Reciprocating Track Grinder



"Ajax" Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY

ESSCO CATALOG
No. 7

Thumbnail description of equipment found in **ESSCO CATALOG Nº 7**

HUNTER-KEYSTONE SIGNS

"Tell the public where you're going" with these clear, clean, readable signs. Bold white letters on black roller curtains make for high visibility by day and by night. They advertise your service and establish your routes.

Whether yours is a remodeling program or a new car building program, in ESSCO Catalog No. 7 you will find a complete line of Keystone Car Specialties that provide for increased attractiveness, comfort, convenience and safety.

Get your copy of ESSCO Catalog No. 7.

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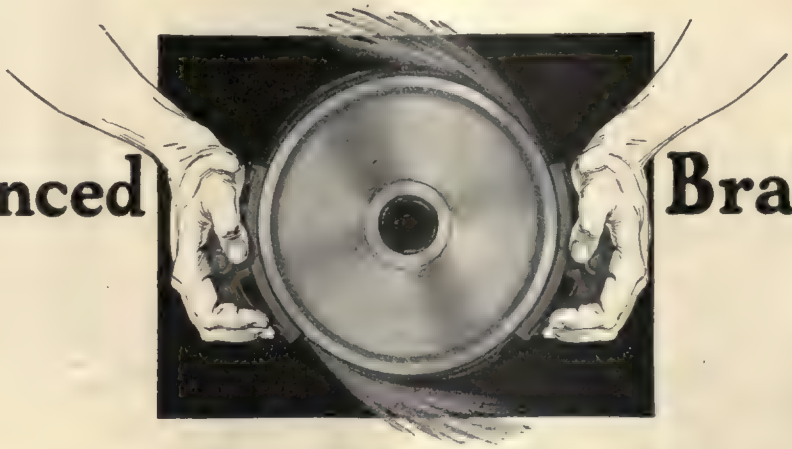
ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

ASF

Balanced Braking



Double the Braking Area—

Double it—and you decrease over 50% the required energy absorption per brake shoe.

Double the braking area and you greatly increase the friction coefficient.

Double it and you can attain a higher rate of retardation.

Double it and you decrease the frequency of brake shoe replacements.

The "SIMPLEX AND AMERICAN MULTIPLE UNIT" clasp brakes with two brake shoes per wheel instead of one, doubles the braking area and accomplishes these results.

AMERICAN STEEL FOUNDRIES
NEW YORK CHICAGO ST. LOUIS

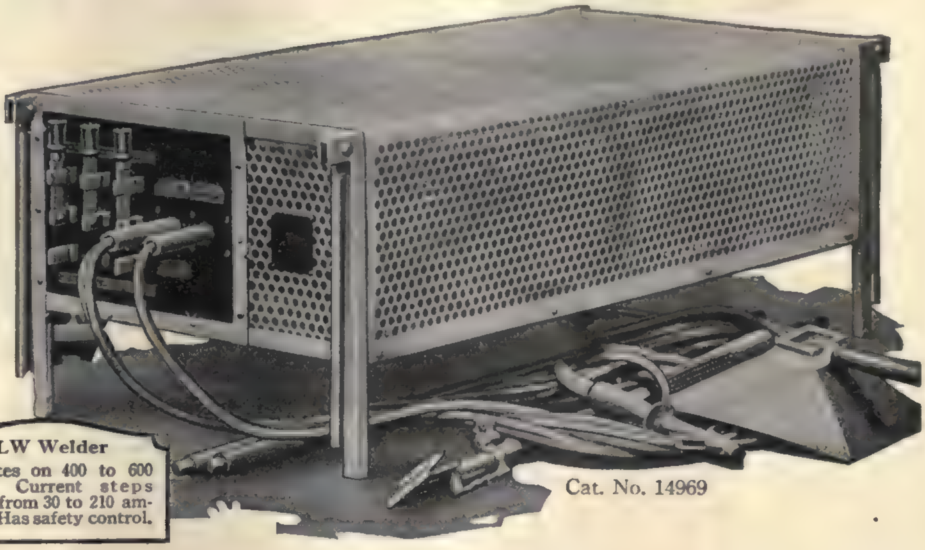
American Multiple Unit Clasp Brake

O-B ENDURANCE IS SERVICE INSURANCE

The Titon Bond, for ball-of-rail application on standard joints. Cat. No. 14841.

The Hevi-bede Titon Bond, for use on heavily beaded or Weber type joints. Cat. No. 15269.

The AW-12 Bond for base of rail. Cat. No. 14776.



LW Welder
Operates on 400 to 600 volts. Current steps range from 30 to 210 amperes. Has safety control.

Cat. No. 14969

Good Bonds Plus Good Welding With This O-B Combination

EACH of these bonds is provided with large heavy terminals, open on the side facing the rail. Their size and shape prove an advantage in welding, making it easy for the welder to direct the arc where it's wanted. As a result, the electrode metal is arc-fused directly to the terminals, cable strands and rail, uniting each to the other in a solid, homogenous weld.

Equally important is the large contact area afforded by the design of the terminals. It insures high mechanical strength as well as excellent conductivity. A further assurance of long and efficient service is provided in the copper sleeves for protection against vibration where the cable strands enter the terminals.

For applying these bonds at the least possible cost, there is nothing to equal the O-B Light-weight portable welder. It marks a new high standard in resistance welder performance. Construction is on a unique unit basis that cuts voltage stress in half, permits perfect insulation of resistance wires without stretching or sagging, and affords maximum durability and strength to the complete unit.

Write for descriptive folders on both O-B Copper Arc Weld Bonds and the LW Welder. Ask the O-B representative, or address

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
392B

Ohio Brass Co.

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

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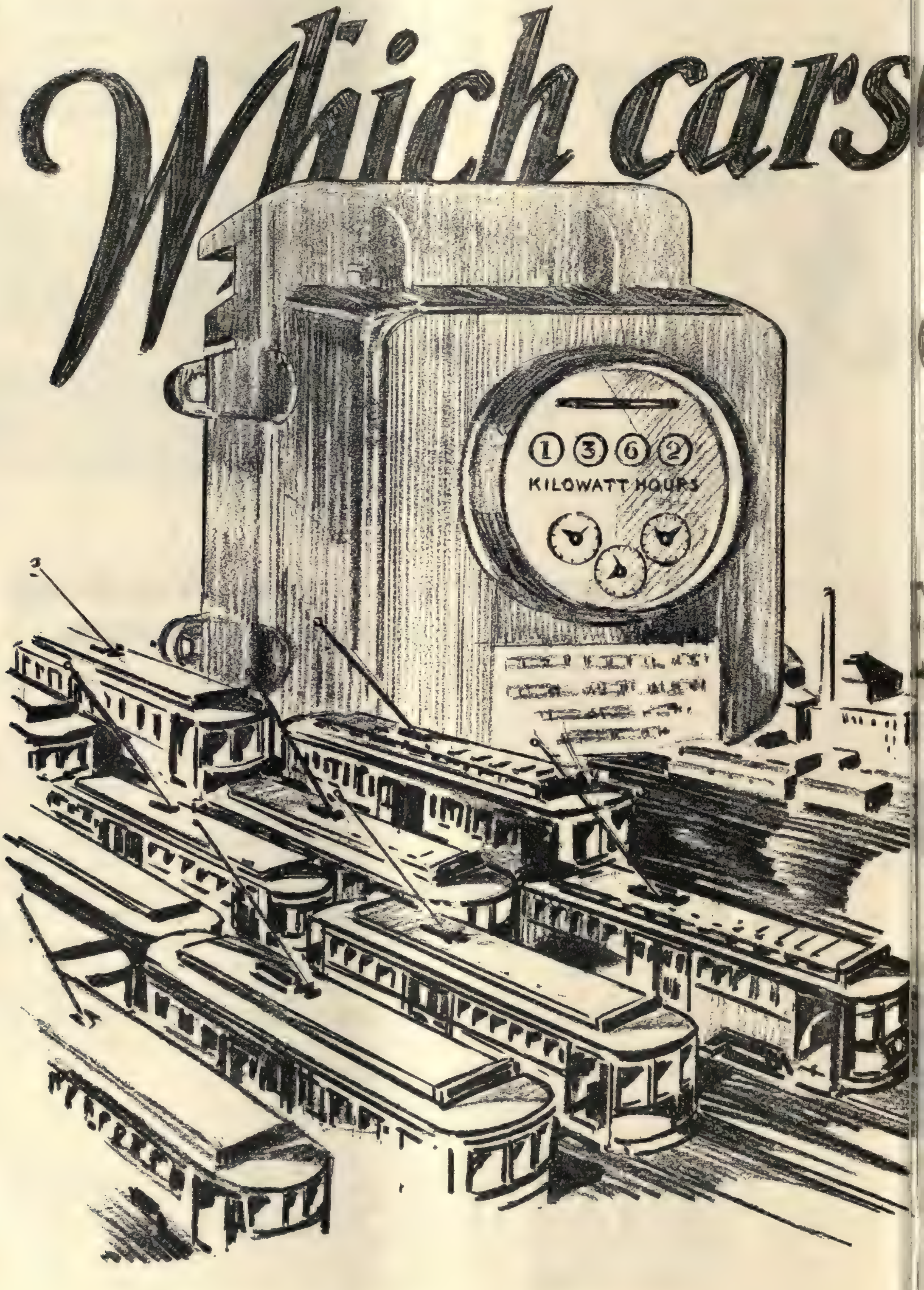

Which cars
1362
KILOWATT HOURS

are due for Inspection

The best service possible is the objective of the entire industry, and *Scientific Inspection* is a key to good service. The most logical, automatic and fool-proof method of announcing when such inspections are due, is by the use of the Car Inspection Dials of

ECONOMY METERS

Three inspection dials are supplied. The "A" Dial is for light inspections corresponding to a 500 to 2000-mile period. The "B" Dial is for heavy inspections corresponding to an 8000 to 15,000-mile period. The "C" Dial is for general overhaul inspections corresponding to a 30,000 to 60,000-mile period.

The system is very flexible and may be fitted to any desired set of inspection intervals.

No clerical work is necessary to determine when inspections are due. By simply glancing at the meter the shopmen can tell whether or not the car is due for any one of the three inspections.

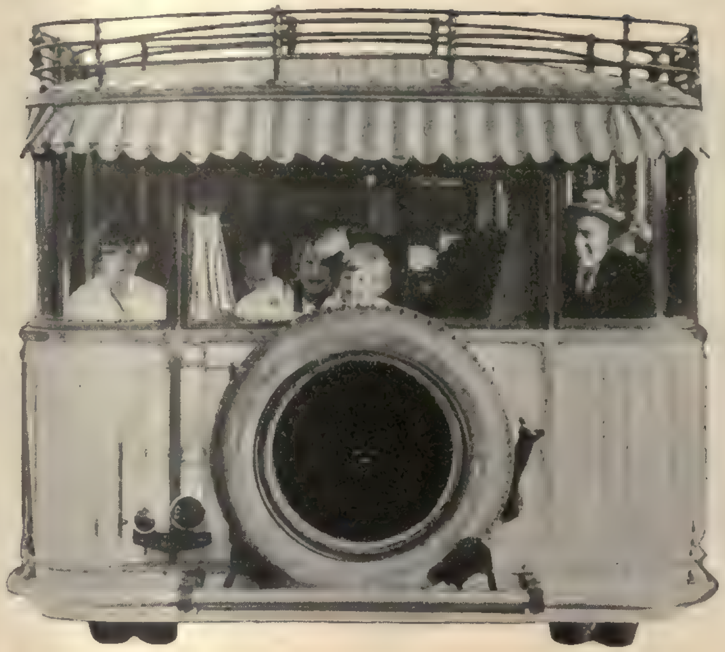
Careful and correct operation of the equipment not only saves power, but also decreases the need for inspection. On the kilowatt-hour basis of inspection such operation automatically lengthens the inspection interval without increasing the hazard.

Metering the energy improves car operation. Improved car operation lessens the need for inspection.

ECONOMY ELECTRIC DEVICES COMPANY
37 W. Van Buren St., Chicago

Sangamo Economy Meters **Woods Fare Boxes**
Peter Smith Heaters **Bemis Boyerized Truck Specialties**
Haskelite and Plymetl

The Automotive Air Brake, a product of the Westinghouse Air Brake Company, who has spent fifty-eight years in brake research, development, and manufacture, is recommended and supplied, as standard factory equipment, by the foremost manufacturers of modern motor coaches.



Why The Westinghouse Air Brake

1. Air Brakes increase revenue in coach operation, by facilitating the use of vehicles of high carrying capacity, and permitting higher schedule speeds in safety.

2. Air Brakes save time, by allowing coach drivers to confidently hold close formation in traffic lines, eliminating the annoying small car cut-ins from side lanes.

3. Air Brakes, by their unique equalizing feature, eliminate side sway at retarding intervals—and prolong life of linings, by uniformly distributing wear.

4. Air Brakes give longer vehicle life, through their smooth action, by eliminating chassis and body strain caused by unequal gripping of shoes.

5. Air Brakes make for satisfied operators—by minimizing physical effort in braking, one of the most arduous operations, in modern coach-control.

6. Air Brakes stimulate public confidence in the stopping ability of the modern heavy coach whose power and speed range rivals that of the trimmest roadster.

WESTINGHOUSE TRACTION BRAKE CO.
Automotive Division, Wilmerding, Pa.

WESTINGHOUSE
AUTOMOTIVE AIR BRAKES

6180

Ideal Transmission of Power

depends upon the final unit—the axle-shaft. It should serve that one purpose only.

Mack axle shafts carry no weight. They transmit power.

Mack designs axle-shafts for but one purpose—the transmission of power. This demands a full-floating shaft, and none but Macks are truly full-floating.

Mack axle-shafts drive through ten splines at each end, raised above the diameter of the shaft and so fitted into case-hardened drop-forged hubs that a universal action frees the shaft of wheel play. Mack axles can be removed without jacking the wheel.

Mack axle-shafts have a wide margin of strength over maximum requirements; made of the finest heat-treated chrome-nickel steel, ground to a perfect finish, they are the toughest axles known; twisted 90° they will spring back to true.

The Virginia Electric & Power Company, a subsidiary of Stone & Webster, uses 54 Mack four-cylinder buses

What is the labor cost?

Finest materials and workmanship do not alone effect the highest economy. Unproductive labor-time used in tearing down and building up to do a simple job is the greatest part of maintenance cost.

In large fleets such as that of the Virginia Electric & Power Company, minutes saved in labor-time are dollars earned—a truth learned by experience and comparison. Those having a background of this essential knowledge, buy Macks.

The Virginia Electric & Power Company has discovered by experience the tangible value of Mack simplicity and accessibility, an example of which is the Mack full-floating axle-shaft. It can be quickly removed without jacking or removing the wheels.

Mack simplicity and accessibility increase earning power by reducing the big maintenance item—labor cost.

Fewer shop hours—More road hours.

Mack Trucks, Inc.
International Motor Company
25 Broadway, New York City

The Safest Passenger Carrier Known

The safety of the *modern* Street Car has been amply demonstrated under any and all conditions. And N P Door and Step Control has proved of material aid in establishing and maintaining the record of the *safest passenger carrier known*.

NP

NATIONAL PNEUMATIC COMPANY
Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

Round the Country with

Phono-Electric

AVERAGE LIFE—*Four and a half years*

at one of the busiest intersections in the world

Broad Street, Newark, does not belie its name. Yet where it is crossed by Market Street, the traffic streams in a steady four-line flow practically all day long. This is claimed to be one of the busiest street intersections in the World.

No small portion of the traffic is trolley traffic. Car passes on Broad Street average 907 a day in each direction throughout the year; on Market Street 1066 passes per day, —as hard a wire test as could be devised. And yet the Public Service Railway Company, — a consistent user of Phono-Electric at such heavy-wear points since 1911—reports an average life of 4½ years for the wire at Broad and Market Streets.

Clear demonstrations of superiority such as this, coming as they do from all over the country, give the soundest possible reason why Phono-Electric is now the standard wire specification wherever wear and safety factors assume importance.

The Phono Book goes into details for the engineer on the subjects of tension, tensile strength, conductivity, etc. A copy can be mailed to you without delay.

"Bridgeport"
BRASS CO.
TRADE MARK
Phono-Electric

Bridgeport Brass Company
BRIDGEPORT - CONNECTICUT

Trolley Wire

Selling A Better Service

- - - - *at an economic gain*

Safety Cars are modern cars, whether they be new cars, or old equipment adapted to Safety Car Devices Control.

Safety Cars are modern cars, inasmuch as their feature of concentrated control, permits the operation of more cars, at faster schedules, at no increase over old operating costs.

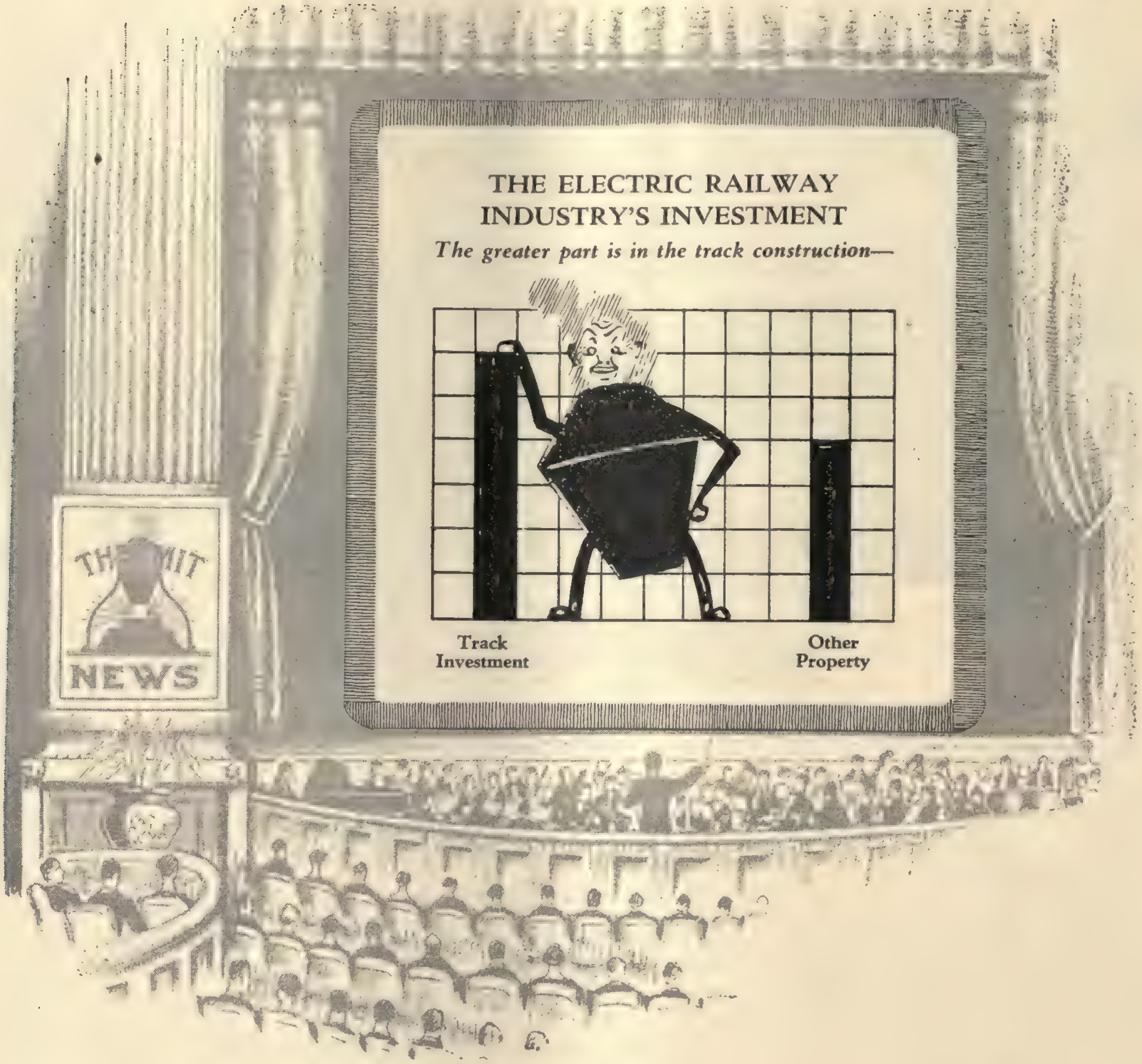
Safety Cars stimulate public good-will, by affording better service, at better schedule speeds, which means increased patronage.

Safety Cars do Sell A Better Service at an economic gain, which accounts for their nation wide acceptance.

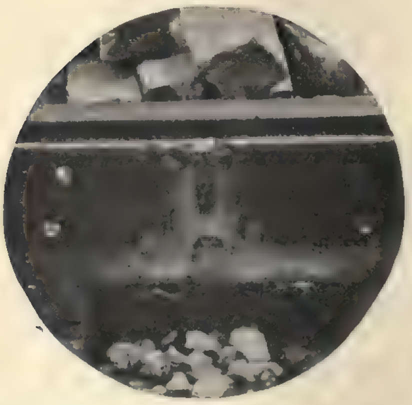
SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

3114

"We make the Safety Car Control Devices which make the Safety Car."



Not jointed—*joined!*



THE most expensive part of the physical property of an electric railway is the track.

Track construction costs average approximately $50,000 per mile of paved track.

Therefore, can you afford to use anything less than the most permanent type of construction? Under these circumstances Thermit welding, which eliminates the biggest weak spot—the joint—would justify itself at almost any cost.

Yet, today, the cost of Thermit welding, is no more than the usual cost of jointing rails when bonding and other incidentals are considered. But Thermit welding *joins* not *joints* the rails, and *"the first cost is the last cost."*

METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.

PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

UNITED STATES TIRES ARE GOOD TIRES

Motorcoach Routes of Greater Profit...

Lower cost per tire mile!

After all, that is the net of what a motorcoach operator is looking for in tire equipment.

And lower cost per tire mile means not only greater mileage, but trouble-free service—unfailing, continuous.

The United States Royal Cord Motorcoach Tire is designed and built *specifically* to give lowest possible cost per tire mile in motorcoach service.

What is more to the point—it is actually cutting tire costs on motorcoach routes in every part of the country today.

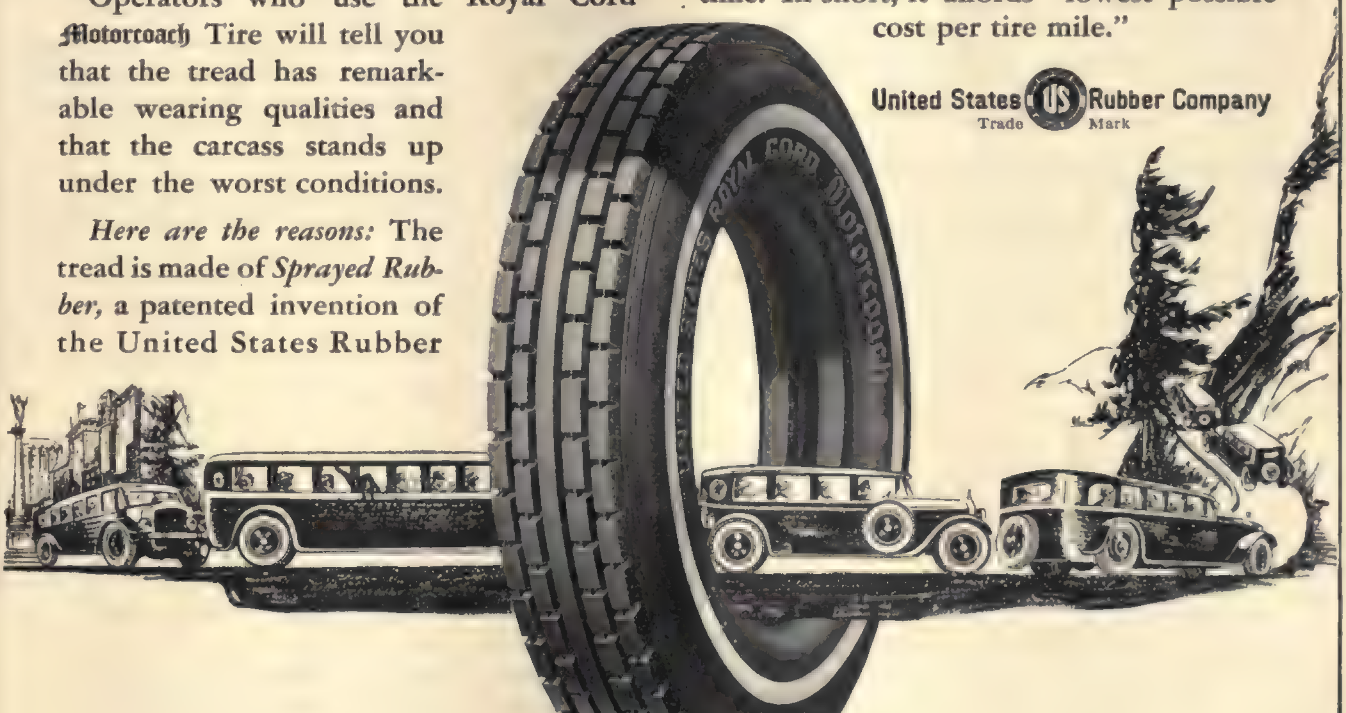
Operators who use the Royal Cord Motorcoach Tire will tell you that the tread has remarkable wearing qualities and that the carcass stands up under the worst conditions.

Here are the reasons: The tread is made of *Sprayed Rubber,* a patented invention of the United States Rubber Company. It is free from smoke and acid. It is tougher, more uniform, and of higher tensile strength than any rubber known.

Web Cord, another United States Rubber Company development, is used in building Royal Cord Motorcoach Tires. It consists of strongest cotton cords, soaked in *virgin rubber latex.* This latex surrounds and webs the cords together *without cross-tie threads*—thus eliminating one of the greatest causes of internal friction and carcass failure. Web Cord has maximum strength and maximum flexibility.

The Royal Cord Motorcoach Tire gives mile after mile of super-service—eliminates tire-failure delays and keeps schedules on time. In short, it affords "lowest possible cost per tire mile."

United States Rubber Company
Trade Mark


UNITED STATES ROYAL CORD Motorcoach

UNITED STATES
ROYAL CORD Motorcoach

Interior View of One
of Bethlehem Track
Layout Buildings

Track Specialties *for* Electric Railways

Laying out and fitting up of special trackwork in an especially equipped shop before shipment is assurance that the trackwork will assemble accurately on the job. All materials used are manufactured in Bethlehem Plants to the high standard of Bethlehem quality and workmanship.

Catalog or descriptive literature sent on request

A condensed list of Track Specialties

Tee and Girder Rails; Bethco Rail Anchors; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Steel Alloy Steel Crossings; Guard Rails; Abbot and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates; Pole Line Material; Mine Ties; Light Rails; Switches; Switch Stands; Grimm Rail Clamps and Industrial Track Specialties.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

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New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh Buffalo
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Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of Our Commercial Products

BETHLEHEM

Now "TYPE F"

WELDING ELECTRODE

TYPE A
for use on cast iron.

TYPE B
for use with automatic welders.

TYPE F
for general welding of steel.

In absolute reliability of operation and overall efficiency, there is no superior to G-E Arc Welders. They are available in all sizes, all types—for either hand or automatic operation—for single or multiple-operator.

The success of Type B, G-E Welding Electrode in automatic welding, prompted the development of Type F for general steel welding.

The new Type F has the desirable characteristics of Type B in a new form.

It has stability, uniformity, and produces clean, strong welds.

Its stability permits an operator to deposit more metal with a given current consumption.

Its uniformity provides good working conditions continuously.

Clean, strong welds make every job a good one.

The new Type F, treated by a special General Electric process, costs no more than good, bare steel wire and its economy in use is naturally much greater.

A special G-E Welding Electrode Distributor near you will be glad to give you further facts and samples.

Special Distributors for G-E Welding Electrodes

American Steel Eng. Co.,
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Harron, Rickard & McCone,
139 Townsend St.,
San Francisco, Cal.

Robert M. Hartwell,
353 East 2nd St.,
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Industrial Sup. Co., Inc.,
329 East Second St.,
Los Angeles, Cal.

Hendrie & Bolthoff Mfg. & Supply Co.,
Denver, Colo.

P. F. McDonald & Co.,
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Boston, 27, Mass.

Matthews Electric Sup. Co.,
1823 First Ave.,
Birmingham, Ala.

The C. S. Mersick & Co.,
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National Welding Equip. Co.,
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also
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Norfolk, Va.
Richmond, Va.

Southwest General Elec. Co.,
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Oklahoma City, Okla.

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Cleveland, Ohio.

Union Iron Works,
Spokane, Wash.

Virginian Electric Inc.,
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A. J. Wilson Co., Inc.,
120 Liberty St.,
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W. A. Ramsey, Ltd.,
74 Queen St.,
Honolulu, Hawaii.

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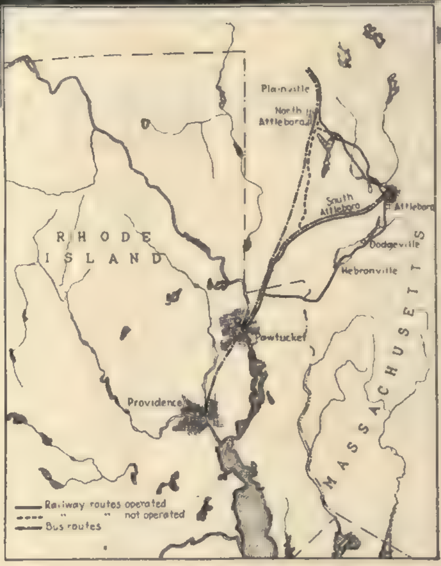
GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT



The reduced expenses, and often increased revenue, mean such a large annual return on the investment that modern cars soon pay for themselves—and then they go on earning more than the obsolete cars they replaced.

New light-weight cars help retain railway service for "the Attleboros"

The history of the Interstate Street Railway covering recent months is another story of the power of modernization to make railway operation pay.

This road operated at a loss, passed into receivership and was sold at auction. Then it purchased lighter, attractive cars, G-E equipped; began one-man operation; increased schedule speeds; reduced substation costs by the adoption of automatic control; and promoted public good will.

Savings made during three months' operation total more than $13,000—an annual return of 65% on the new-car investment.

General Electric equipment has been chosen for many of the recent outstanding, forward-looking car developments. It has helped to make many of the operating records which have established so conclusively the value of the modern light-weight car.

	Operating costs per car-mile for 3-month period during 1925		Reductions in operating costs per car-mile for accounts affected by the new cars	
	Old Cars	New Cars	Cents	Per cent
Way & Structures	4.10¢	2.38¢	—	—
Equipment	8.11	3.14	4.97¢	61%
Power	8.80	5.43	3.37	38
Conduct. Trans.	13.06	9.02	4.04	31
General & Misc.	3.52	5.93	—	—
Total	37.59¢	25.90¢	12.38¢	33%

330-18

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Master Mechanics Are Leading the Way

IN TWO sections of the country the master mechanics have taken into their own hands the matter of improving their performance. This is being accomplished through the Southern Association of Equipment Men and the Central Electric Railway Master Mechanics' Association. Though working along entirely different lines, the objectives of these two groups are the same, namely, comparison of routine maintenance practices and the stimulation of improved methods.

These men do not come together for ordinary meetings in the usually accepted sense of the term. Their gatherings are actually working conferences and their purpose is to learn from each other. Consequently, there is a benefit to each man which can be applied in his daily work and there is a self-created stimulus toward improvement which is of immeasurable value to the property he represents. There is no better way to arouse ambition in a man's mind than the example afforded by progress on the part of his neighbor.

Both these groups of mechanical men have found a point of common interest which ties them together and furnishes the theme for their meetings. For the Southern men this consists of a continuous comparison of maintenance costs and pull-in records. Regular reports are furnished to a secretary and each member receives a complete record of his standing in comparison with his associates. A truly remarkable improvement in the performance of most of the participating properties has resulted. The Central Master Mechanics' group is tied together by the common problem of interchanging freight equipment. Already its work has resulted in the design of a standard freight car, in the preparation of standard rules for inspection and in considerable progress on a standard set of charges for interchange equipment repairs. It is hard to realize now that these men originally formed their association in the face of executive opposition from some of the properties in the territory!

Nitrocellulose Lacquer Finishes Are Passing Through a Development Stage

SINCE the introduction of nitrocellulose lacquers for painting electric railway cars maintenance men have been extremely interested in the results obtained. The advantages of quick-drying and chemical inertness offer possibilities for reducing the shopping time of cars and increasing durability of the paint that have great economic value. The use of lacquers for painting steel cars is increasing, but there are several problems to be solved which make progress slow. One of the most serious of these is that most of the painting of electric cars is done by placing new paint over the old. The majority of cellulose lacquer manufacturers do not guarantee satisfactory results unless the old paint or varnish is removed completely.

The matching of different shades of color is another problem that has been commented on quite frequently by maintenance men. There seems to be considerably more difficulty in matching a particular color with cellulose lacquer than with the types of enamels and paints commonly used. Lacquer acts quite differently from the usual types of enamels, varnishes and paints used and the spray method of application is necessary. This may cause prejudice among painting forces, which can be overcome only by considerable educational effort, supplemented by improved equipment and facilities adapted particularly for use with cellulose lacquers.

The investigation of painting results made by the equipment committee of the American Electric Railway Engineering Association last year indicated that while many of the cellulose lacquer systems when applied to steel cars had excellent wearing qualities, when applied to wood they gave very unsatisfactory results. It also appeared that there is a wide variation in the qualities and properties of the lacquers of different manufacturers. Railway maintenance men judge all lacquers by the results which they obtain with the particular product they are testing. At present there are 70 or more producers of cellulose lacquer paints and a variation of quality is to be expected quite as great as results from the various oil paints and varnishes. It should be kept in mind that some are sure to prove unreliable, but the success of the entire lacquer principle should be judged by the best results obtained rather than by the failures of inferior grades.

Serious Damage to Pavement Caused by Overloaded Trucks

TIME was when a well-laid pavement lasted many years. No longer is this true. Nowadays pavements often go to pieces before the bonds issued to pay for their construction mature. The reason for this short life, of course, is the widespread use of automotive vehicles. The exact relation between use and wear is of vital interest to those responsible for paving construction, including most of the electric railways, but it is extremely difficult to determine this relation accurately.

Tests made by the United States Bureau of Public Roads show that the impact force of a moving vehicle is much greater than the static load. Hence the design and condition of the springs and tires have a direct

This is the issue in May that is devoted essentially to maintenance and construction subjects

relation to the wear on the pavement. So far as the original design is concerned, it is entirely possible for the public authorities to enforce regulations that will protect the pavement from damage. Methods of maintenance and operation, however, are of equal importance, and are much more difficult to control.

Illuminating figures have been compiled in Connecticut indicating that much damage is due to the overloading of motor trucks. A transportation survey in that state disclosed that among 34,817 trucks actually weighed, 10,523, or more than 30 per cent, were loaded over their rated capacity. The larger trucks were found to be more often at fault than the smaller vehicles. Many carried loads that exceeded not only their own rated capacity but also the maximum legal load of 25,000 lb. Of the total number weighed, 2.1 per cent exceeded this legal maximum.

The harmful effect of this practice is easy to understand. Every truck loaded beyond its capacity subjects the pavement to an excessive strain under the treads of its wheels. Those loaded beyond the maximum limit are even more destructive. Few pavements are designed with a large factor of safety, and any load considerably in excess of the allowable limit is likely to cause serious damage.

It is comparatively easy to limit the rated capacity of a truck to a weight that can be carried safely on wheels with any given bearing area. But it is difficult to prevent the loading of the truck considerably beyond that point. Realization is needed of the harm which results from this practice. Electric railways have a large paving investment at stake, and they might well take the lead in a campaign to prevent this needless destruction.

Order and System Are in the Interest of the Individual

ENVIRONMENT plays a large part in the lives of most of us. It would be incorrect to say that we take on the character of our surroundings, but we do tend to reflect their character. The force in a shop headed by a man lackadaisical in his attitude tends to become lackadaisical in its general conduct. The man who turns a steel car wheel should be no less exact about his work and do the job no less expeditiously and expertly than the banker who is putting through a loan that requires an analysis of the financial stability of a borrower. Each man is probably following the bent of his talents, and each should give to the job before him the best that is in him. Does this sound platitudinous? Does it smack of Henty? Let us admit that it does. Was ever anything accomplished without an ideal?

Of course, craftsmanship in an electric railway shop—if such a term may be applied—does not offer the opportunity for the exercise of that degree of skill which would be possible to a man working, say, as a silversmith. Still, each is an artisan in his line. Each should take an equal interest in the work he turns out. All of which brings up the point that the relationship between the employer and the worker is a bilateral one—that it is reciprocal. The responsibility does not rest on the workman alone.

Men do not do good work in a shop that is cold in winter, improperly lighted at all times, poorly ventilated and ill-equipped for the work that is to be carried out in it. This would seem to be so self-evident that the need would not exist to repeat these strictures against management. Too frequently, however, conditions do exist that militate against a man doing his best. If the management is without pride, soon the men don't care. That is inevitable. In the shop and in the carhouse there should be a place for everything and everything should be in its place. It is possible to be orderly without being fussy. And order makes for the dispatch of work—any kind of work. Shops come to mind that are the last word in appurtenances, and they are the shops in which production is the greatest. This is not a matter of expediency. The man really works hardest who is constantly in a turmoil as to what he shall do next and how he shall go about it. Taylor in his time studies proved this to be the case.

If order and system should rule in the shop and the carhouse, so should it rule with respect to the buildings themselves. The grounds should be kept shipshape. This is easy to do by stimulating interest to that end among the employees. In many instances the shop and carhouse men have been stimulated to greater effort along these lines by competition among them. That is a detail. Where pride alone fails to offer the necessary stimulus, then the task is one that should be formally assigned. Let us achieve these ends by stimulation if possible, but let us achieve them anyway.

Postponement of Depreciation Case Should Not Lead to Neglect

IT WAS good news, indeed, for the electric railway industry when the sub-committee of the depreciation committee, consisting of Ralph R. Bradley, B. W. Warren and Managing Director Storrs, obtained an indefinite postponement of the depreciation hearing before the Interstate Commerce Commission which had been set for May 23. Had the industry been called upon at this time to go through with its hearing the lack of adequate data would have made it extremely difficult to make an effective presentation of the electric railway situation.

Among far-sighted executives it is generally recognized that depreciation must receive adequate consideration by the properties themselves and that on many properties more liberal reserves for obsolescence as well as depreciation must be provided in the future than have been set up in the past. In some few cases, perhaps, inadequate depreciation reserves may be attributed to negligence. But in the vast majority of cases this is not the situation. For a number of years the industry has been faced with the primary problem of meeting its current operating costs and fixed charges. Due to pyramiding costs, on the one hand, and restricted fares on the other, to say nothing of automotive competition that nearly proved to be overwhelming, the principal task of the railway executive for a number of years was to find a way of continuing operations on almost any basis. When one reviews the list of receiverships during the war and post-war years it is not surprising that some properties did not adequately take care of their depreciation.

Now that the industry is fast coming out of the doldrums, under service-at-cost franchises and a more liberal public policy regarding transportation fares, it is important that the rate of fare be determined with an adequate regard for the needs of both obsolescence and depreciation. But the fixing of an arbitrary and inflexible requirement by the commission at this time for setting up depreciation reserves would have set back the entire electric railway industry just when it is beginning to work out its salvation.

Postponement of the hearing by the Interstate Commerce Commission is therefore a welcome respite. It is important, however, that this should not lead to neglect by the industry of so important a matter. The commission's action merely allows more time for adequate preparation of the electric railway case. This the depreciation committee is endeavoring to do. It has a difficult and burdensome task in collecting needed data and is entirely dependent on the co-operation of operating companies. Questionnaires have been sent out for this purpose. Each company called upon for information must do its full part in helping the committee to show why a depreciation order for electric railways at this time is not in the best interests of the properties or the public they serve. Companies whose operations are entirely local in character should be equally interested with those that are interstate carriers, because a ruling by the Interstate Commerce Commission would probably have a very strong effect on the subsequent action of state regulatory bodies. Now that the opportunity is afforded for adequate preparation, it would be extremely unwise to let the matter drag.

Good Patterns Help Reduce Machining Costs

MANY electric railways make their own patterns for certain types of castings and then send them to a local foundry when castings are needed. The castings are machined in the railway company's shops. This procedure usually insures early delivery of the parts needed to return a car to service much more quickly than would be possible otherwise. One great objection to the practice is that sometimes, due to unfamiliarity with foundry practice, patterns are not so designed or constructed that they will produce economical castings.

The importance of high-grade patterns is not confined to the economical production of castings. It includes machine shop costs, expenses of assembly, serviceability of the castings and losses due to rejections, as well as cost and selling price. Patterns constructed properly assist in obtaining better castings, quicker delivery and lower machining costs.

Modern foundries are insisting that patterns be mounted. Nearly all the molding operations, when a loose pattern is used, require hand work, and uniformity is dependent entirely on the skill and judgment of the molder. Mistaken judgment regarding risers may result in shrink holes in the castings, sometimes detected in the foundry, but often not found until considerable machine work has been done. Lack of care in choosing the parting line results in patched molds and castings with improper contour. Excessive rapping of patterns unnecessarily increases casting dimensions and weights and reduces the life of the pattern.

Poorly constructed patterns are likely to warp, which causes dimensional errors in the castings. Loose patterns are subject to more breakage than mounted patterns on account of the molding procedure required. Pattern repairs delay production. Where single castings or very small quantities are used, electric railways frequently consider that the additional cost for a mounted pattern is not warranted, but frequently benefits will result that more than justify it.

In days preceding the present keen competition and intensive production foundries accepted any kind of pattern equipment which might be furnished. As cost and production were of minor consideration, judged by our present standards, castings accepted as satisfactory were produced from such equipment. These conditions have changed, and the fact that foundries have developed improved methods of making castings which necessitate new standards for patterns is an illustration of progress.

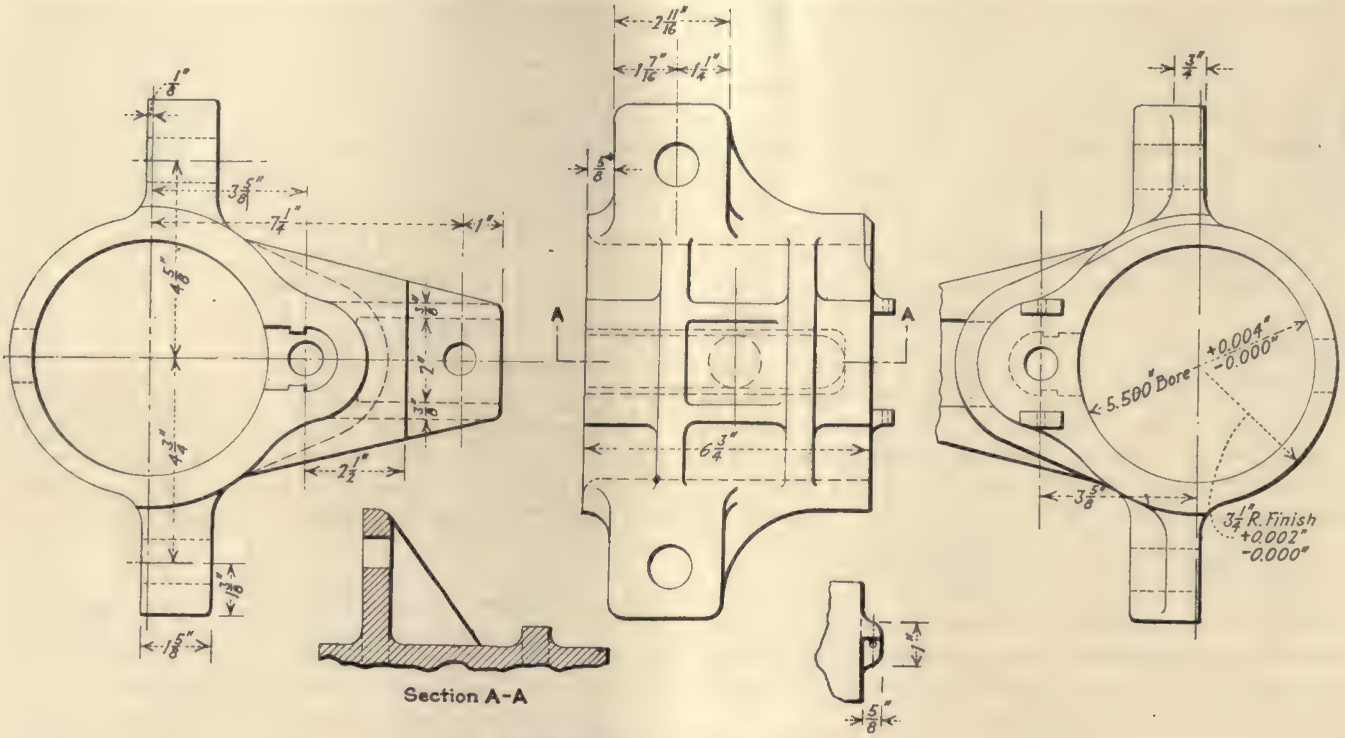
Why Not March Along the Hypotenuse

WHEN the German army tried to crush the British on the retreat from Mons, it made the fatal mistake of marching along two sides of a triangle when it could have intercepted the column of the "Old Contemptibles" by marching along the hypotenuse. While it is a far cry from the strategy of Von Kluck in 1914 to the deliberations of the purchases and stores committee of the A.E.R.A., nevertheless we may gain much from a comparison. To wit: During a discussion on May 16, 1927, of the sub-committee's report on the tracing and expediting of ordered material, W. E. Scott of the Philadelphia Rapid Transit Company made a constructive and telling argument against the long-accepted practice of the purchasing department being the official "tickler" for the tardy vendors.

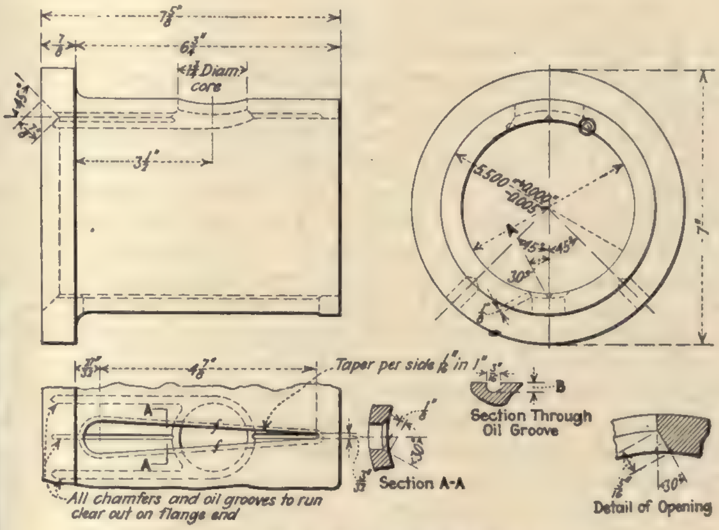
In other words, Mr. Scott proposed that the stores department, after placing its requisition with the purchasing department, make direct contact with the vendor to expedite delivery, thereby eliminating the work of several clerks, to say nothing of proving that a straight line is the shortest distance between two points.

Although with one exception, that of C. A. Harris of the Philadelphia Company, the committee was against Mr. Scott's proposal, he nevertheless made such a conclusive argument that Chairman Fleming suggested that Messrs. Scott and Harris prepare their arguments in the nature of a minority report for discussion at the coming annual convention of the association.

Chairman Fleming undoubtedly acted wisely in taking this means of developing a minority viewpoint. Any method, no matter how radical, that will cut the red tape that is prevalent in all business; that will speed up the selling of popular transportation, should surmount all precedents, no matter how long such precedents have been established. While Mr. Scott's proposition may have some very practical objections from the purchasing department's viewpoint, it seems worthy of serious consideration. In the handling of important contracts it may be better for the purchasing department to follow the matter of delivery. But in many cases this is now done directly by the department for which the order is placed, particularly when that department handles the matter of inspection during construction, as in the case of an order for new cars. In following delivery of the large volume of miscellaneous material that is purchased during the year, therefore, there seems to be merit in Mr. Scott's contention that the stores department is the logical agency for maintaining contact with the vendor. In this age of efficiency and short-cuts none of us want to march along two legs of a triangle when we can accomplish our purpose by treading the hypotenuse.

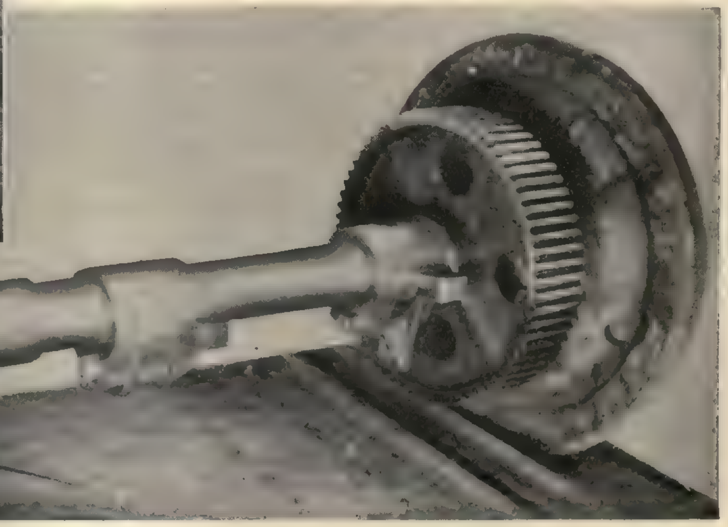


Wedge key axle bearing housing


7 5/8"
7/8"
6 3/4"
1 1/2 Diam. core
3 1/4"
7"
5.500 +0.000 -0.005
45°
30°
4 7/8"
Taper per side 1/8" in 1"
B
Section Through Oil Groove
Section A-A
All chamfers and oil grooves to run clear out on flange end
Detail of Opening
30°

Details of axle bearing used with wedge-type housing

Below, wedge-type axle bearing housing in place on truck



At right, the housings are placed on the axle before wheels are installed

Housing Type Bearing

Adapted for Axles

Boring a pair of wedge-type axle bearings

Wedge type axle bearings used by the Third Avenue Railway, New York City, make accurate fits easy to obtain and, due to the tight fit of bearings in their housings, wear, with its resulting noise and trouble, is reduced

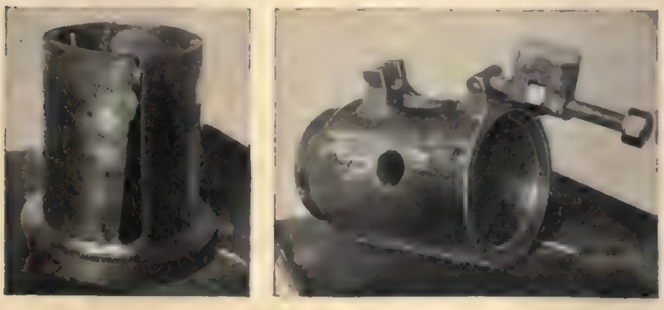
OBTAINING accurate fits for railway motor axle bearings has always been difficult on account of the type of construction used. In order to place them on an axle they must be of a split type. Even though the inside bore fits the axle accurately, when used on old motors there is sure to be found some wear in the axle bearing fit of the motor frame. If the original movement be ever so slight the bearing will be subjected to blows of impact which are destructive and soon cause rapid wear and looseness of fit. Due to the wear of axles in service, the bearing fits are of widely varying sizes. Where axle bearings are carried in stock with bores arranged in steps to fit different diameter axles the workman is supposed to pick one that fits best, but usually he picks one that fits easiest. As a result, bearings start off with a poor fit.

To overcome the troubles which result from improperly fitted axle bearings, J. S. McWhirter, superintendent of equipment of the Third Avenue Railway System, New York, has developed a new type of axle bearing which is now being marketed by the Waugh Equipment Company. These bearings have been applied to the GE-210 and Westinghouse 56 types of motors operated by the Third Avenue Railway, and it is planned to adopt them for all other motors operated by the company.

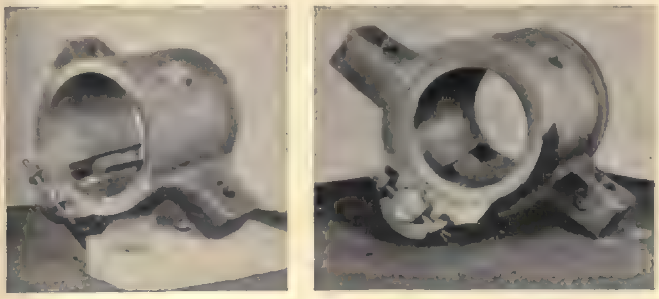
In the construction of this bearing a wedge-shaped piece of nickel steel fits into a corresponding wedge-shaped space at the split of the two halves of the axle bearing. The wedge can be drawn up or loosened by means of a screw, and so the bearing liners are forced tightly against the inside bore of the axle bearing housing which takes the place of the axle cap on the motor. Accompanying illustrations show the details of construction.

The axle bearings are made of bronze and when finished have a ½-in. wall. The opening for the wedge is 4⅞ in. long and each side has a taper of 1 to 16. The large end is 11/16 in. wide and the narrow end 7/16 in. The wedge has an upper section 1.23 in. wide by 1⅜ in. high that fits into a correspondingly sized opening in the housing. This upper section of the wedge is tapped for a ¾-in. stud, which when turned draws the wedge back and forth in the slot in the housing and forces the axle liner tightly into the housing bore. The wedge also serves as a key to prevent turning of the bearing relative to the housing.

The general construction of the housing is similar to that of the axle cap which it replaces, but it is made solid, the thinnest section of the wall being ½ in. On motors having cast-iron babbitted axle bearings there is room for the new housing with ½-in. bronze

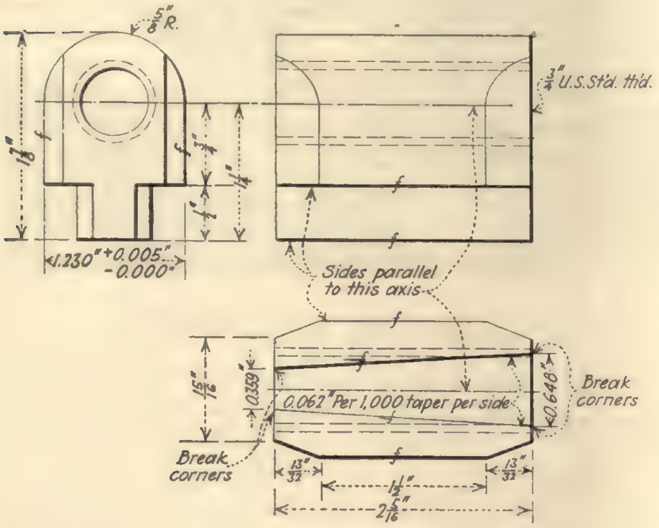


At left, a pair of finished axle bearings ready for installation. At right, type of chuck used for boring wedge-type axle bearings



At left, housing for wedge key axle bearing. At right, bearings in place in axle housing. Screw for tightening wedge at bottom bearings. The Westinghouse 56 motors to which this has been adapted had cast-iron babbitted axle bearings and no additional work was necessary on the motor shells. The GE-210 motors have bronze axle bearings, so it is necessary to rebore the axle bearing fit of the motor shells to ½ in. larger radius to accommodate the new housing.

Since the housings are solid, it is necessary to place them on the axle before wheels are pressed on. This is no disadvantage, however, since the life of the housings is several times that of a pair of wheels, and new bearings can be installed as easily as with the previous arrangement. The housings are bolted to the motor frame with the same bolts that formerly held the axle caps, so no additional drilling and tapping is needed.



Type of wedge key used. This is made of nickel steel and fits accurately the corresponding space in the bearing

Particular care is taken in the various machining operations to make certain that accurate fits will result when the bearings are installed. The two halves of the axle bearing after being finished on the outside are placed in a wedge chuck for boring. This chuck is essentially a housing of the type that will be used with the bearings. With the bearings inserted, the wedge is drawn tightly so the bearing is expanded into position. The chuck is screwed to the lathe headstock and the boring is done with a bar attached to the lathe carriage. With this set-up for boring a fit is assured that will remain the same after the bearing is installed in its housing. Each bearing is fitted to the axle with which it is to run, the inside bore for new axle bearings being 0.015 in. larger than the axle diameter.

The practice of the Third Avenue Railway is to install all bearings at the general overhauling shop. The work is then done by experienced men and is taken out of the hands of inexperienced carhouse men. The installation is very simple; with the housings on the axle the bearings are pushed in and the wedge is drawn. The wedge screw is kept from turning by a cotter pin which passes through the housing and head of the bolt. The housings are bolted into position the same as the ordinary axle cap. Dirt is prevented from getting into the end of the bearings by counterboring the wheel hub so that it forms a permanent dust guard for the bearings.

Overhead Fixtures Inspected on a Car-Pass Basis in Cleveland

By Determining the Number of Car Movements that Can Be Allowed Safely at Points of Severest Service a Maximum Is Established for that Particular Line

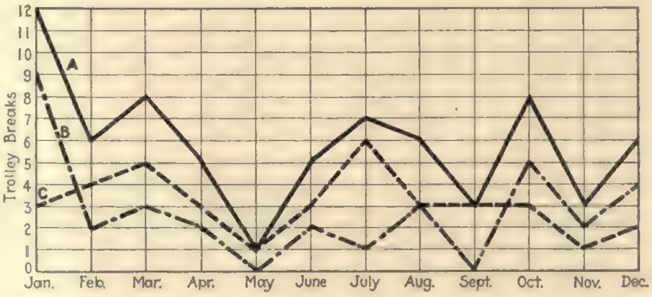
By Angus Scott
Assistant Superintendent of Overhead Lines, Cleveland Railway, Cleveland, Ohio

EXCELLENT results have been obtained from the method of inspection and maintenance of trolley wire fixtures used by the Cleveland Railway, which sets a definite number of car movements as a basis. For ears the number of car movements is established at a point just ahead of car stops where they receive the severest usage. Figures will, of course, vary with different localities, types of material and the equipment running over the lines. The figure that is now being used in Cleveland is 60,000 car passages. When this number of car movements has been covered on a line, a crew will inspect the fixtures and remove the worn-out material.

Taking, for example, a line which has 240,000 car movements per year, 60,000 passages are registered in three months time. In this fashion a table is drawn up to include every line on the system and the renewal dates are set down, as follows:

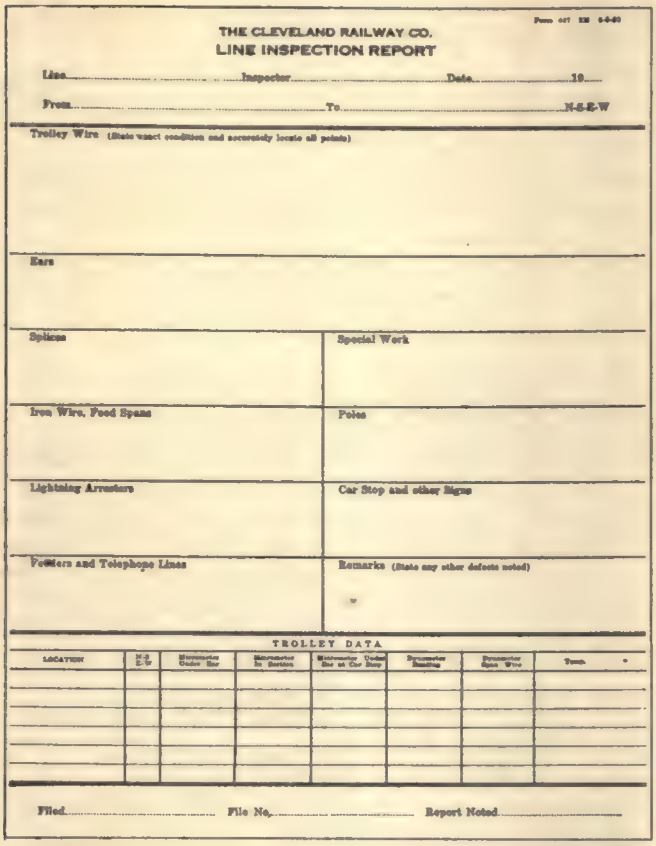
Line (Limits)	Movements Per Year	Renewal Span, Months	Renewed	Foreman	Next Renewal Date
Thale Ave.—Hill Street to Date Street.	Eastbound 240,000	Three	Jan. 1	J. Lee	April 1
	Westbound 240,000	Three	Feb. 1	R. Burt	May 1

The fixtures between the car stops in the line will of course last the longest. Following this plan, when the utmost life is secured from the material it is removed and a constant inspection of the equipment is maintained quickly and when necessary. Also the points where severe wear is encountered are well taken care of. The crew going over the line also functions to some degree as an inspection crew. If trolley wire or other equipment is found in poor condition this is noted and reported. Then a specially trained inspector is sent over the area involved. He fills out an inspection report of the type shown in an accompanying illustration, giving micrometer and dynamometer readings. From these data it may been seen readily whether the equip-



Trolley wire breaks on the Cleveland line during the year 1926

C, burnt down and pulled down.
B, other causes.
A, total



THE CLEVELAND RAILWAY CO.
LINE INSPECTION REPORT

Line............ Inspector............ Date............19....

From............ To............ N-S-E-W

Trolley Wire (State exact condition and accurately locate all points)

Ears

Splices

Special Work

Iron Wire, Feed Spans

Poles

Lightning Arresters

Car Stop and other Signs

Feeders and Telephone Lines

Remarks (State any other defects noted)

TROLLEY DATA

LOCATION	N-S E-W	Micrometer Under Ear	Micrometer In Section	Micrometer Under Ear at Car Stop	Dynamometer Reading	Dynamometer Span Wire	Temp.

Filed............ File No............ Report Noted............

Form of line inspection report used in Cleveland

ment need be renewed or the amount of life that remains.

Through this method of automatic renewals and inspection the trolley failures on the system have been kept to a low figure. A graph of the breaks and an analysis of them for the year 1926 are given. A great many deductions may be made from the graph and causes determined for the increase of trolley failures or breaks in various seasons of the year and at various locations.

It will be seen that graph *A* is the sum of graphs *B* and *C*. Looking at graph *B* it will be noticed that *B* crosses *C* in the month of February and remains below *C* until October, when it again crosses *C* and remains above for the balance of the year. This relationship simply means that the proportion of trolley breaks due to failure in the wire or fixtures shows up in the months when the weather is coldest. Thus when the first cold spell comes in the fall graph *B* reaches a peak in October.

On the other hand, the number of burn downs is shown to be at a maximum during the fair weather months when track and building activities in all lines are at their height. Graph *C* reaches a peak in the month of July. Studying this graph along these lines discloses other subjects on which desired information readily may be secured.

TROLLEY BREAKS FROM ALL CAUSES, 1926

Worn wire	19
Defective fittings	2
Burnt spot	2
Crystallization	6
Flaw in wire	3
Worn fittings	1
Burnt down by foreign shovel	5
Burnt down by Cleveland Railway shovel	2
Burnt down by Cleveland Railway grinder	1
Burnt down by Cleveland Railway welder	1
Burnt down by Cleveland Railway wires	3
Burnt down by foreign wires	11
Burnt down by foreign cars	4
Burnt down by Cleveland Railway cars	7
Pulled down by Cleveland Railway cars	3
Total	70

LOCATION OF TROLLEY BREAKS

Due to worn wire:	
In section	3
At end of ear	3
Under ear	9
Under structure	2
At end of splice	2
Total	19
Due to crystallization:	
At end of section insulator	3
At end of crossing	2
In curve	1
Total	6

Handling Armatures on Monorail System

Entire Process of Cleaning, Dipping and Baking Carried Out While They Are Suspended by Eyebolts from the Trolley

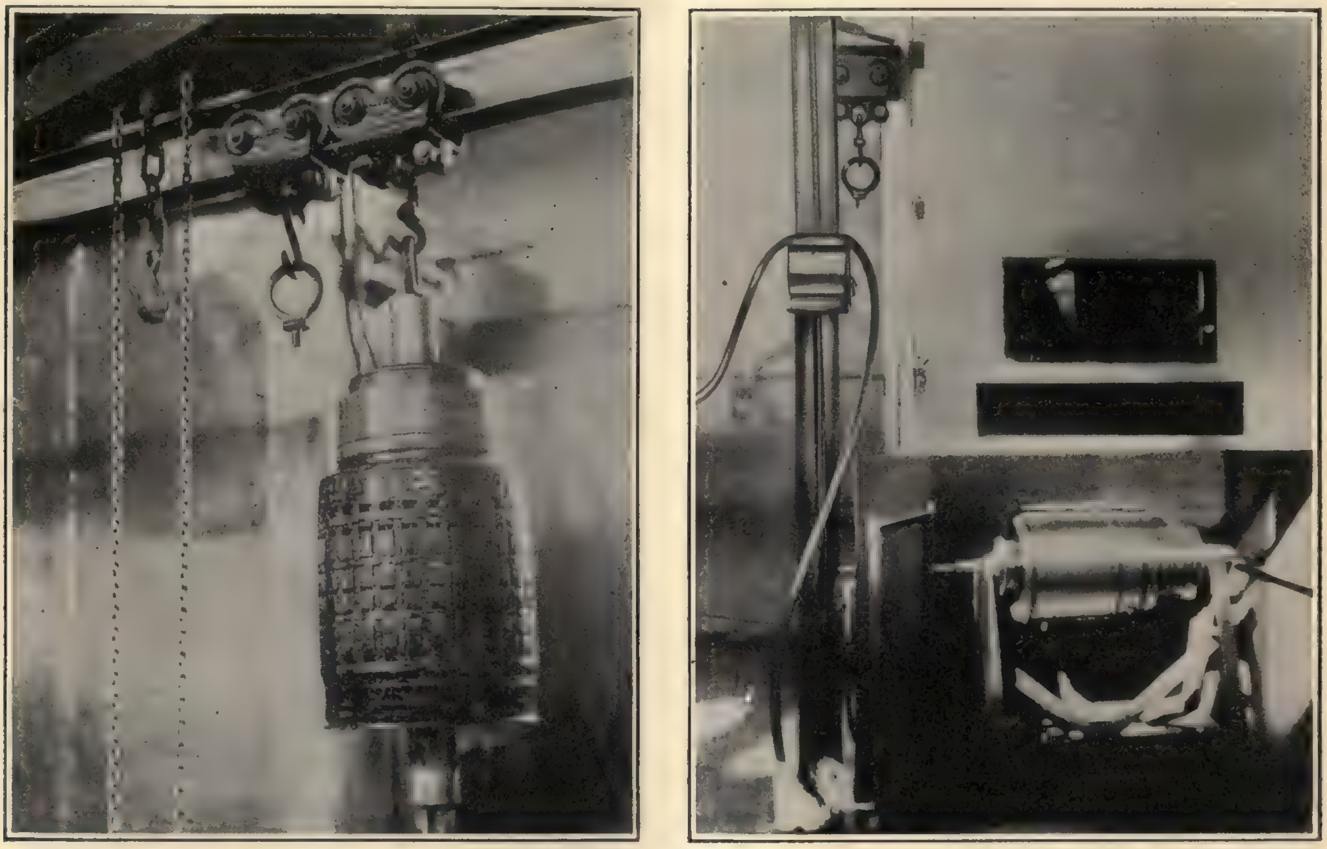
Rewound armatures on the Los Angeles Railway are transported on a monorail system through the various stages of final finish, including dusting, dipping and baking. The armature is suspended from the monorail carriage by an eyelet which is screwed into the commutator end of the armature shaft. For the purpose all armature shafts on this property are drilled out at the commutator end and tapped for a $\frac{5}{8}$-in. standard machine screw. The eyelets, made in the shop, are

Monorail system used to handle armatures

From the preheater oven, on the right, the monorail conveys the armature on a curved piece of track to the main heater, on the left. Between the two heaters is the dipping vat, which is raised by hydraulic pressure to submerge the armature.

forged out of ¾-in. round steel to an inside diameter of approximately 3 in.

After the armature is repaired or rewound it is transported on its carriage truck to the monorail system, where it is raised by a ½-ton differential hoist to the monorail carriage. First, the armature is run into the cleaning cabinet. An opening in the side of this sheet metal cabinet permits the operator to play air at a pressure of 90 lb. on the suspended armature. This removes the dust and dirt from the crevices in and around the winding. The air is exhausted from this chamber by a blower fan which carries the air through a cleaner which removes the dust and dirt by means of water running over screens.



Handling equipment used for armature cleaning, dipping and baking operations

As shown in the view at the left, armatures are suspended from a carriage on a monorail system and conveyed to cleaning cabinet, preheating oven, dipping vat and main heater. The eyelet screwed into the commutator end of the shaft serves as a means of raising the commutator to the carriage, where it is hooked in place. The ½-ton differential hoist is shown.

The illustration at the right shows how armatures are first cleaned in a cabinet, where air at 90 lb. pressure is played upon them. An opening in the cabinet enables the operator to insert the nozzle of an air hose to blow off dust and dirt. This armature has not been raised to the conveying monorail carriage, but is resting on its work dolly truck.

From the cleaning cabinet the armature is conveyed to the preheater, which is an oven capable of accommodating four of the large size armatures. It has doors at each end which permit the armatures to be run in on the monorail. A temperature of 205-deg. F. is maintained in this oven by electric heating coils thermostatically controlled. After twelve hours of preheating the armature is removed, progressing to the dipping vat, where the insulating compound is applied. The monorail makes a complete 180-deg. curve out of the preheating oven into the first and second main ovens. Midway between the preheater and main heater on the monorail is the dipping vat. In this particular installation the vat, with 50 gal. of Sherwin-Williams black Ajax compound, is raised approximately 3 ft. by means of a hydraulic ram. The movement of the ram is controlled by both intake and release valves, so that the height of the dipping may be closely controlled. Before the armature is submerged in the insulating compound a sleeve is placed over the lower end of the shaft to protect it. This sleeve is of such length as to inclose the entire shaft. It is held in place by three springs on the inside which grip the shaft close to the armature spider and hold it securely.

The armature is submerged for approximately two hours, after which the vat is lowered and the armature allowed to drip for a few minutes before being conveyed into the heater. A small pan is hung beneath the armature as it goes into the main heater to catch the drippings.

Each main heater will hold eight armatures and is electrically heated with automatic thermal control to a temperature of 205 deg. F. The armatures are baked in these ovens for 48 hours. A feature of these ovens is the automatic shut-off of power. A control button placed adjacent to the door is actuated by a projecting arm and pointer mounted on the door. When the door is closed the button is depressed and the power turned on. When opened the button is released and the power shut off. This prevents accidents which might result should an operator enter the oven with the power on.

With this system of cleaning, dipping and baking the armature room has an output of one armature every three hours.

Maintaining

Proper Gear-Center Distances*

By P. A. Pontius
Renewal Parts Engineer
Westinghouse Electric & Manufacturing Company

With modern types of railway motors there are ten surfaces where wear will cause spreading of gear centers. The minimum desirable wear for these surfaces is given

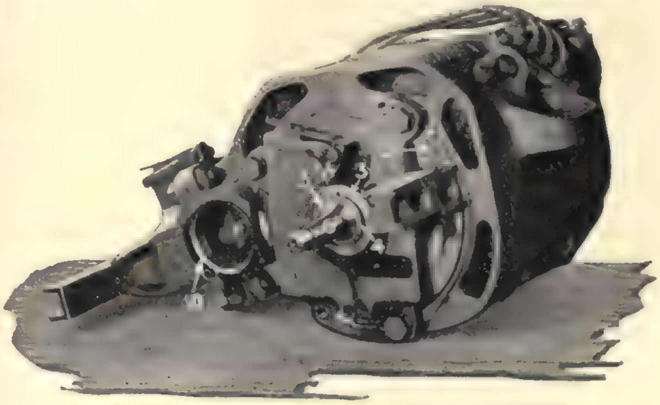
WHEN a railway motor is put in service the gear-center distance is as close as commercially possible to the mathematical dimension specified between the center of the armature shaft and the center of the gear axle for which the motor has been designed. This close fit will be lost more and more with the increased wear of different motor parts. The wear of any or all of the following ten surfaces will affect the gear-center distance: (1) Housing seat in the frame, (2) frame seat on the housing, (3) armature bearing seat in the housing, (4) outside of armature bearing, (5) bore of armature bearing, (6) shaft, (7) axle, (8) bore of axle bearing, (9) outside of axle bearing and (10) axle bearing seat in frame and axle cap.

The first question in the state of evolution of all motors in service is undoubtedly the following: "What is the allowable maximum wear on these different surfaces, i.e., how much wear may be allowed before taking the motor out of service for repair?" This question will be answered in the following for each of the ten surfaces in subsequent order:

No clearance should be allowed between surface 1, housing seat in the frame, and surface 2, frame seat on the housing. A greater allowance than metal to metal fit should always be available; that is, the exact diameter of the housing should always be greater than the fit in the frame. The housing should in no case be loose in a box-type motor and a split-type motor should not be allowed in service if the housing is not clamped tightly enough to keep it from moving in its seat.

If the bolts are kept tight with proper fits, there should be no wear. If the housing is once loose, the wear will increase rapidly, and the housing bolts will tend to work loose and considerable bolt breakage may result. Usually an improved bolt material can prevent, but not eliminate entirely, this breakage. The extensive wear will soon demand a very costly repair of the frame and housing or necessitate a new housing, besides the expense for new and high-grade bolts and the trouble caused by bolt breakage. If the motor is withdrawn from service in due time the comparatively inexpensive repair of the housing only may be necessary. The time for those repairs will be less. Thus the equipment soon can be again on the road, increasing the revenue per car. The total number of cars necessary will be less to maintain a given schedule if the time for repairing the cars and motors is reduced.

Between surface 3, armature bearing seat in the housing, and surface 4, outside of armature bearing, no clearance should be allowed. The metal fit should be such that the bearing is kept in the housing without additional help of the key. The key should be considered as an additional safeguard only to prevent the bearing from turning should it work loose on the road, as a loose bearing may turn so far that the bearing shell closes up the oil opening in the housing, depriving the bearing of the necessary lubrication so that a hot bearing would undoubtedly follow. If the bearing is loose in the housing the established clearance will increase rapidly, as the pounding action of the motor will reduce the outside of the bronze shell and the keyway in the housing will wear. The use of steel bearing shells to reduce the rapid wear on the outside cannot be recommended. Bronze shells are necessary in order to have the additional wearing surface for the armature shaft if the babbitt lining should melt out from hot bearings.



There are ten surfaces subject to wear which affect the gear-center distance

1. Housing seat in frame. 2. Frame seat in housing. 3. Armature bearing seat in housing. 4. Outside of bearing. 5. Bore of armature bearing. 6. Shaft. 7, 8 and 9 are not shown in the illustration. 7. Axle. 8. Bore of axle bearing. 9. Outside of axle bearing. 10. Axle cap and frame bore.

However, as soon as the loose bearing is noticed the motor should be taken out of service and repaired before the bearing fit and the keyway in the housing are worn, as this will necessitate a costly and time-losing welding or machining job, or both.

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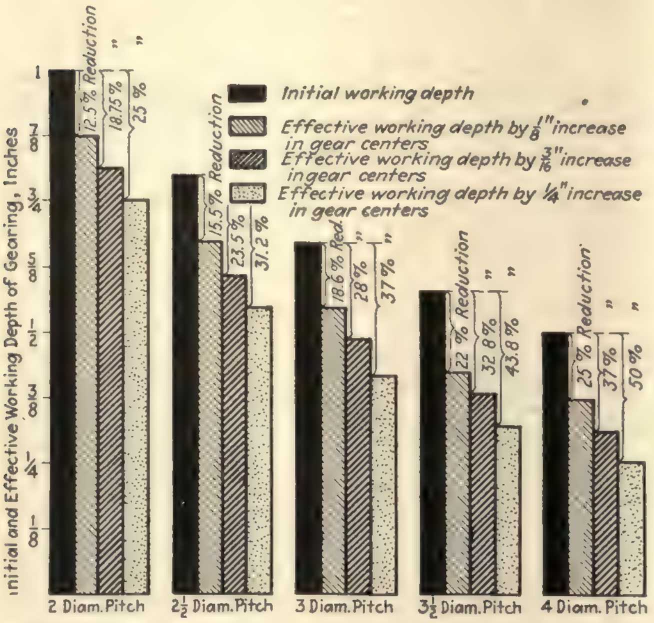
*This is the first of two articles dealing with wear that affects distance between centers of armature and axle shafts.



Reduction of gear mesh caused by increase in gear-center distance and end play

It is recommended that surface 5, bore of armature bearing, and surface 6, shaft, be allowed to wear in service only until there is a total clearance of $\frac{1}{32}$ in. between them. For motors of 50 hp. and above $\frac{1}{16}$ in. is recommended. These close limits on the radial wear are necessary to increase the life of gears and pinions. It also prevents pounding of the armature and wear of motor parts. It eliminates excessive vibration of the armature, reducing wear of commutator, carbon brushes and brush-holders, as well as the breakage of armature coil leads. All these parts will be affected unfavorably by the increased clearance between the armature shaft and bearing bore.

In regard to breakage or wear in the motor caused by interference of stationary parts with rotating parts the maximum total armature end play for motors in service should not exceed $\frac{1}{16}$ in. For motors of 50 hp. and above $\frac{1}{8}$ in. may be allowed. These limits will help to maintain the alignment of the total width of the pinion with the total width of the gear. With reduced armature end play the axial pounding of the armature in the motor will be lessened and interference of the brush-holder with the commutator neck will be eliminated.

In limiting the total wear of surface 7, axle, and surface 8, bore of axle bearing, the reduction in the mesh of gears and pinions is mainly to be considered. A wear in service should be permitted until $\frac{3}{32}$ in. total clearance between axle and bearing bore is reached; that is, diameter of worn bore minus diameter of worn axle should not be larger than $\frac{3}{32}$ in. for motors smaller than 50 hp. A total wear of $\frac{1}{8}$ in. may be allowed for larger motors.

In addition to the above radial wear it is necessary to limit the motor end play. The maximum total motor end play in service should not exceed $\frac{1}{4}$ in. for motors smaller than 50 hp. one-hour rating. For larger motors $\frac{3}{8}$ in. may be allowed. These limits depend mainly on the clearances between the gear and gear case and other points of interference on the truck. It should not be overlooked that the motor is suspended unsprung on the axle side and shocks of the motor are transmitted through the axle bearing to the axle. These shocks are caused (1) by the vertical pounding of the armature depending on the radial wear of shaft and armature bearing; (2) by the axial pounding of the armature depending on the armature end play; (3) by the vertical pounding of the motor depending on the radial wear of axle and axle bearing, and (4) by the axial pounding of the motor depending upon the motor end play on the axle.

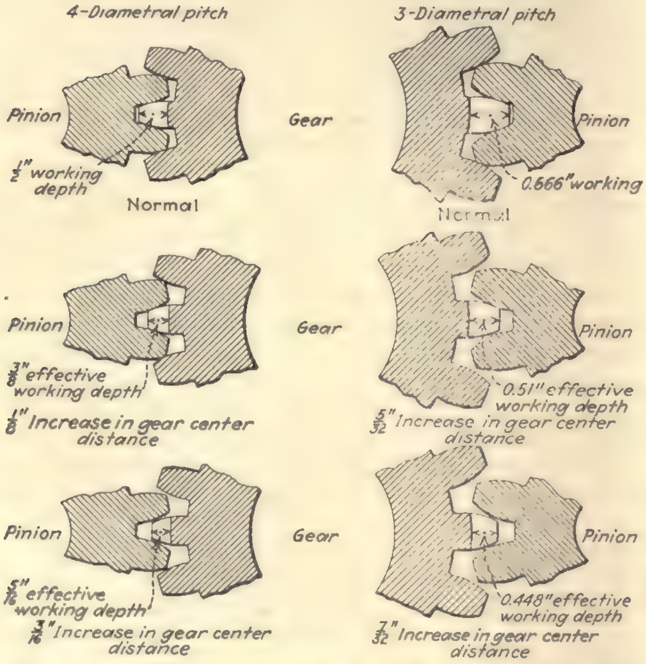
These numerous actions of the motor are transmitted to the truck and track, causing wear on all parts affected.

No clearance should be allowed between surface 9, outside of axle bearing, and surface 10, axle bearing seat in frame and axle cap. The bearing should be clamped tight in its seat in order to prevent it from being shaken about. The loose bearing will soon be hammered smaller on the outside, as the motor will pound on the bearing with energy proportioned to the motor weight and the power transmitted from the pin-

BEARING CLEARANCE AND END PLAY RECOMMENDED AND TOLERATED FOR RAILWAY MOTORS

Recommended maximum reduction of $W \times F$ within 30 per cent.
Tolerated reduction of $W \times F$ within 40 per cent.

Motors with		Clearance Between Points				Increase in Gear-Center Distance		Recommended Armature End Play	Recommended Motor End Play	Reduction of Effective Gear Width
		5–6 Armature Bearing		7–8 Axle Bearing						
Diameter Pitch	Width of Gear Face	Recommended Maximum	Tolerated	Recommended Maximum	Tolerated	Recommended Maximum	Tolerated			
4½	3½	$\frac{1}{32}$	$\frac{3}{64}$	$\frac{5}{64}$	$\frac{7}{64}$	$\frac{7}{64}$	$\frac{5}{32}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
4	3½	$\frac{3}{64}$	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{11}{64}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
4	4	$\frac{3}{64}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{9}{64}$	$\frac{3}{16}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
3½	4	$\frac{3}{64}$	$\frac{1}{16}$	$\frac{7}{64}$	$\frac{9}{64}$	$\frac{5}{32}$	$\frac{13}{64}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
3½	4½	$\frac{3}{64}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{11}{64}$	$\frac{11}{64}$	$\frac{13}{64}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
3	4	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{13}{64}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
3	4½	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{9}{64}$	$\frac{3}{16}$	$\frac{11}{64}$	$\frac{13}{64}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$
3	5	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{7}{64}$	$\frac{9}{64}$	$\frac{11}{64}$	$\frac{7}{32}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$
2½	4	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{11}{64}$	$\frac{15}{64}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$
2½	5	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{1}{8}$	$\frac{11}{64}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$
2½	5½	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{11}{64}$	$\frac{11}{64}$	$\frac{11}{64}$	$\frac{17}{64}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$

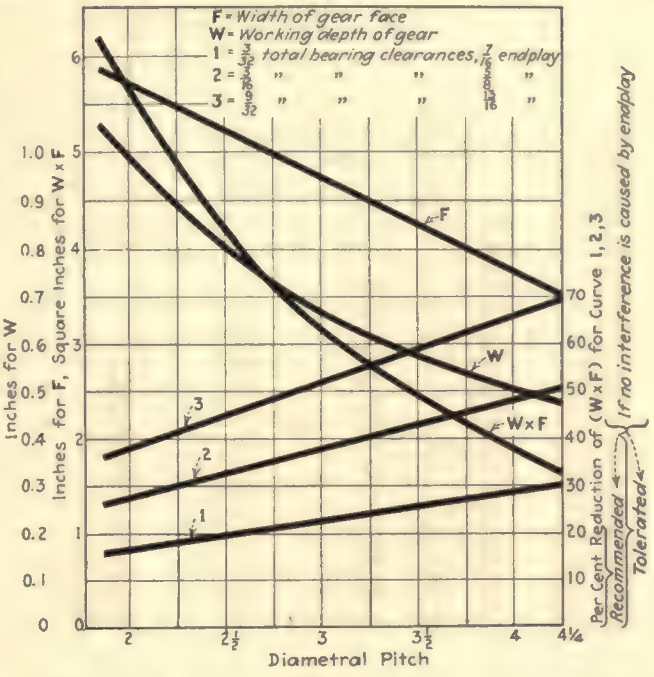

4-Diametral pitch
3-Diametral pitch
Pinion
Gear
Pinion
1/2" working depth
0.666" working
Normal
Normal
Pinion
Gear
Pinion
3/8" effective working depth
0.51" effective working depth
1/8" Increase in gear center distance
5/32" Increase in gear center distance
Pinion
Gear
Pinion
5/16" effective working depth
0.448" effective working depth
3/16" Increase in gear center distance
7/32" Increase in gear center distance

Depth for different spreads in gear centers and for different diametral pitches ion to the gear when the motor is started. The continuous knocking of the axle against the bearing when the wheels pass over rail joints or switches will also tend to reduce the outside of the bearing. It is, therefore, necessary to make these bearings from high-grade bronze alloy, which, however, should not be so hard as to cause excessive wear on the axle. Cast iron or malleable iron babbitt-lined bearing shells have generally been eliminated.

If the axle bearing is loose it should be clamped tight by means of axle cap bolts or by replacing the loose bearing. The motor should be taken out of service as soon as it is found that the new bearing cannot be

REDUCTION OF GEAR MESH CAUSED BY INCREASE IN GEAR-CENTER DISTANCE AND END PLAY

Clearance Between Points					Armature End Play	Motor End Play	Per Cent Reduction of Gear Width × Working Depth					
1–2	3–4	5–6	7–8	9–10			4 DP 3½ F	3½ DP 4 F	3 DP 4½ F	3 DP 5 F	2½ DP 5 F	
0	0	1/32	1/16	0	3/16	1/4	29.0	25.5	22.5	21.5	20.0	Up to 30 per cent recommended if no interference is caused by end
0	0	1/32	1/16	0	1/4	[illegible]	33.0	29.5	26.0	24.75	23.0	



Spread of gear centers due to wear between points 5-6 and 7-8

gear face has to be considered. Under the worst conditions the maximum total end play may be equal to the sum of armature end play plus motor end play. Similar increase in gear-center distance will reduce the depth of gear mesh (working depth) and the end play will reduce the alignment of the pinion width with the gear width. The reduced depth of gear mesh or effective working depth has to be multiplied with the effective gear width and the product of these factors should be compared with the initial dimensions when the gearing is properly aligned. This comparison will show the total reduction in the area of the gear mesh. The reduction in this area will increase the pressure per square inch on the teeth of the gearing and, therefore, the wear increases, which again reduces the mileage obtained on the gear and pinion of such motors. An accompanying table gives the per cent reduction of the product (Working depth) × (width of gear face) when properly aligned for the prevailing pitches and vidth of gear face of motors in service are calculated. assumed clearances and end plays for the facilities are not available for babbitting bearings and machining motor parts.

In the graphs showing reduction of gear mesh caused by increases in gear-center distance and end play, the diametral pitches of the gearing are plotted on the horizontal axis. The initial working depth of the gear teeth is shown on the vertical axis by graph *W* each depth above its pitch. The width of gear face is indicated by graph *F*. This width of the gear face is assumed to be continually decreasing in proportion to the increase in diametral pitch. The width *F* multiplied by the working depth *W* is the same as the measurement (curve $W \times F$) for the area of the gear mesh. The product of $W \times F$ is also plotted on the vertical axis above the respective pitch. Graphs 1, 2 and 3 indicate the per cent reduction of the $W \times F$ under consideration of their respective armature and axle bearing clearances between points 5-6 and 7-8 plus armature and motor end play as specified. The per cent of reduction which each point of these graphs represents can be found by the scale given on the vertical axis on the right-hand side of the illustration. The different values taken from the graphs are given in the following tabulation for 3 and 4½ diametral pitch:

Diametral pitch (D.P.)	3	4½
Assumed width of gear (*F*), initial, inches	4¾	3½
Working depth of tooth (*W*), initial, inches	0.67	0.47
$W \times F$, square inches, gearing aligned perfectly	3.15	1.65
Per cent reduction of $W \times F$ (1) $\frac{1}{32}$ in. increase in gear-center distance, $\frac{3}{16}$ in. end play	23	30
Per cent reduction of $W \times F$ (2) $\frac{1}{16}$ in. increase in gear-center distance, ⅜ in. end play	38	50.5
Per cent reduction of $W \times F$ (3) $\frac{3}{32}$ in. increase in gear-center distance, $\frac{11}{16}$ in. end play	52	59

The 30 per cent reduction recommended and the 40 per cent tolerated are indicated on the scale for the per cent of reduction. The reduction of $W \times F$ depends largely on the clearance between the wearing surfaces. The end play is of less importance than the gear mesh.

The maximum allowable increases in gear-center distance and end play should depend on the diametral pitch of each motor. The recommended maxima (within 30 per cent) have been calculated and the respective dimensions for armature and axle bearing clearances and end play are given in another table for the most prevailing pitches and gear widths. The corresponding dimensions for 40 per cent reduction of $W \times F$ tolerated by smaller roads are also shown in the same tabulation

The allowable armature end play and motor end play should be checked carefully in regard to interference of stationary part with rotating parts within the motor or of motor parts with parts of the truck. It should be borne in mind that the life of many motor parts as well as gears and pinions and truck and track will be affected by the foregoing limitations.

Figures Corrected

IN THE article "Base Plate Joint Developed by Eastern Massachusetts Street Railway," published in this paper April 30, two minor errors appeared. At the top of page 775 under "General Summary of Bending Tests," the load for the fishplate joint instead of reading 266,300 lb. should be 244,200 lb., and on the same page under the "Summary of Tests on 9-in. Girder Rail," the same average figure, given as 266,300 lb., should read 244,200 lb., as above. This mistake was made in the original data computation and was due to the fact that the preparation of the material for the article was hurried. On page 776 the two joints on 7-in. tee rail shown in illustrations in the right-hand column were welded with 7-in. x 36-in. x 1-in. plates.

Finished track on Madison Road with concrete surfacing in track area

Cincinnati Is in Midst of Intensive Reconstruction Program

Terms of new franchise necessitated considerable track reconstruction. Co-operation between the city and railway facilitates progress. Elimination of noise and riding comfort are given careful consideration

ELEVEN miles of 5.21-ft. gage track was rebuilt in Cincinnati, Ohio, during 1926, as the first step in an elaborate program of track reconstruction. This was included in the terms of the franchise granted to the Cincinnati Street Railway, which became effective on Nov. 1, 1925. This reconstruction is only part of an extensive plan for the rehabilitation of the entire property.

Although 11 miles of single track was reconstructed last year, it is planned to make 1927 a year of still greater activity. The program calls for rebuilding at least 27 miles of single track. In the franchise it is anticipated that a considerable part of the total trackage will be reconstructed by 1930.

A thorough analysis of the conditions of the track throughout the entire property showed that after years of service certain sections had become worn out, loose, distorted and in immediate need of replacement. On the major portion of these sections the tracks were completely removed and new foundation, ties and rails installed in accordance with the company's adopted standard design.

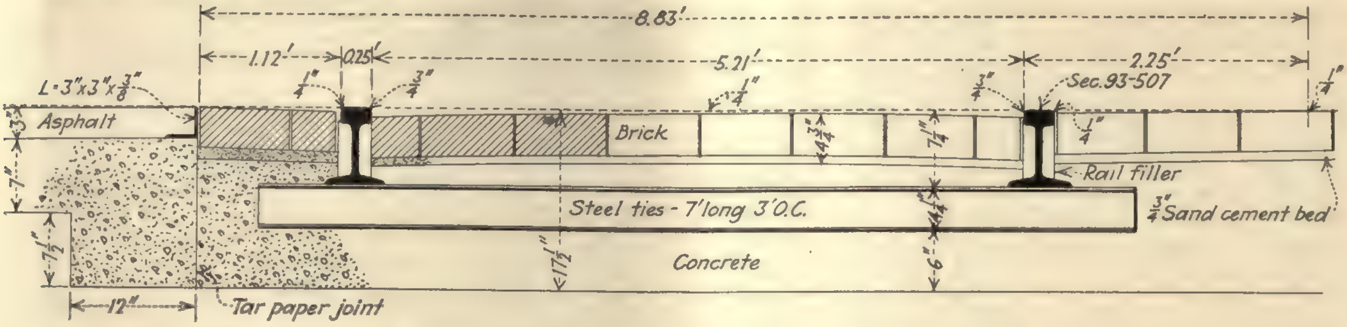
Although the franchise specified reconstruction of certain tracks due to necessary street improvements, the company nevertheless went to considerable expense to rebuild several other sections not covered by the franchise. This additional work, performed primarily to improve the riding qualities of the cars and eliminate unnecessary noise, has caused favorable comments from the communities affected and has had the effect of increasing the public friendliness.

The old foundation of the section of track located in Madison Road between Elmhurst and Observatory Road was retained and, as a result, caused some little difficulty and a slight departure from the company's standard construction. After the pavement was removed from this section it was found that the concrete was in perfect condition and suitable for years of further service. It was accordingly decided to remove and scrap the worn-out rails and ties. The tie pocket centers in this old foundation for wooden ties were 2 ft. apart, whereas the company's standard tie pocket spacing for steel ties is 3 ft.

TEMPORARY TRACK USED TO CONTINUE TRAFFIC

Excavation work was started on April 26. It was decided to work on one track at a time and continue service on a two-track basis, with a temporary track erected on the pavement adjacent to the track under construction. Rails were laid to gage on wooden ties spaced on 24-in. centers. Excavated refuse was placed around and between these ties as ballast. Rails, stone, cement, ties, etc., were speedily delivered to the job by means of motor trucks and rail cars, the method of transportation depending on the urgency and the traffic situation. When possible all excavation was done with power machinery.

Due to the size of the tie pockets and the elevation of the top of the concrete foundation retained it was much cheaper to use a steel tie and a rail of slightly different dimensions from the company's standard than to attempt cutting the concrete to suit the standard material. As a



Cross-section of standard track construction used by Cincinnati Street Railway

result a 6-in. T-rail and a 7-ft. Carnegie M-24 tie with No. 23 clips and bolts were used instead of the company's standard 7-in. T-rail and a 7-ft. M-25 Carnegie steel tie with No. 23 clips and bolts. Girder rail of 140-lb. section was installed on all curves. Steel ties were placed in the old concrete tie pockets with 2-ft. centers and bolted to the rail. A ½-in. space was left in the rail joints to allow sufficient space for thermit welding of the joints. Carey elastite filler was used on either side of the rail.

After the track was gaged, lined up and brought to grade concrete was poured in and around the ties and rails in sections. This acted as a retaining foundation for maintaining the alignment, at the same time leaving room for the thermit welding of the joints. The rail was made solid throughout its entire length and no provision was allowed for any additional expansion or contraction.

The concrete for the pavement in the track area was mixed 1:1½:3, whereas the concrete for the track foundation was mixed 1:3:6. A piece of two-ply tar paper separated the city street pavement foundation at the railway line from the railway track foundation. Similar separation of the track surfacing from the street surfacing was accomplished by means of a 3-in. x 3-in. x ⅜-in. angle laid on the railway line parallel with the rail.

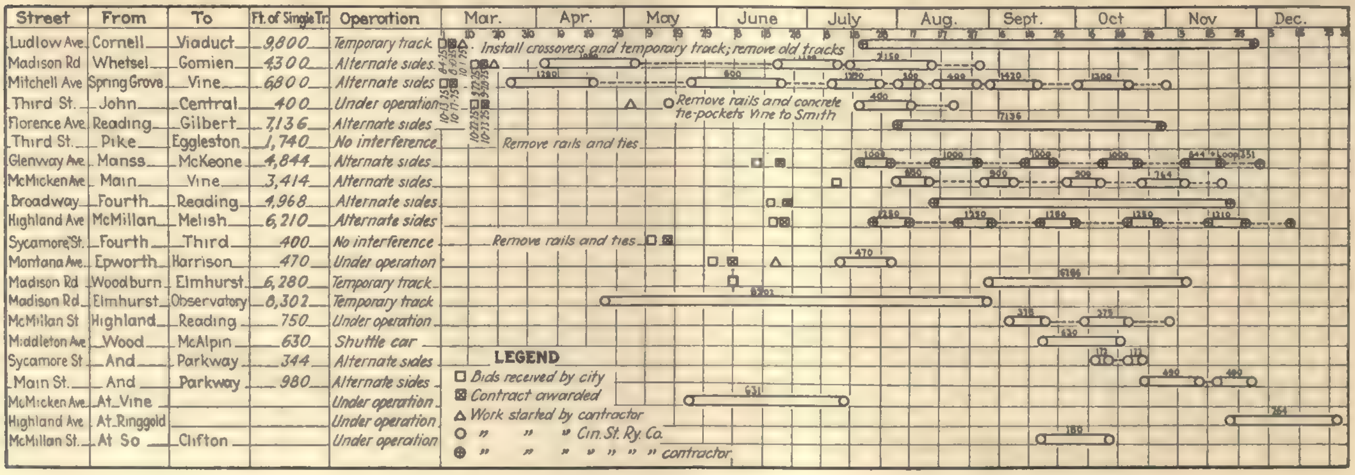
Although the type of construction used on Madison Road is slightly different from the company's standard, it is believed that it will prove equally serviceable. After the completion of the first track the second was torn up and rebuilt in the same manner. Reconstruction was brought to a successful completion without a single service or vehicular interruption of any great duration. This Madison Road job consisted of rebuilding approximately 8,302 ft. of track. An average gang of 70 men was employed on this work for approximately 220 days.

FULL CO-OPERATION EXISTED

The first year's program consisted of the reconstruction of 21 sections of track varying from a minimum length of 344 ft. to a maximum length of 9,800 ft. The tracks removed had been in continuous operation for the past fifteen to twenty years. As it was found that considerable variation existed in the construction, each section had to be analyzed independently and considered as a separate problem. A careful study was made of all details involved and a definite program of procedure was decided upon. Careful preliminary plans of operation were prepared to assure non-interruption of service and a decision reached as to the best method. The decision to use a single track or to install a temporary one for the maintaining of non-interrupted service on a certain section was given to the interested parties before the work was started. Explicit orders were also issued to keep the vehicular traffic in motion.

Full co-operation existed between the railway company and other public utilities. Where it was thought that conduit or other lines of these companies might interfere with the track construction, ample notice was given in order that provisions could be made to take care of the relocation without causing any interruption of the work.

Details regarding grades, roadway, drainage, etc., were discussed with the city engineers prior to starting the reconstruction as well as during its progress. This co-operation between the railway and the city engineer-



Street	From	To	Ft. of Single Tr.	Operation
Ludlow Ave.	Cornell	Viaduct	9,800	Temporary track
Madison Rd	Whetsel	Gomien	4300	Alternate sides
Mitchell Ave	Spring Grove	Vine	6800	Alternate sides
Third St.	John	Central	400	Under operation
Florence Ave.	Reading	Gilbert	7,136	Alternate sides
Third St.	Pike	Eggleston	1,740	No interference
Glenway Ave.	Manss	McKeone	4,844	Alternate sides
McMicken Ave.	Main	Vine	3,414	Alternate sides
Broadway	Fourth	Reading	4,968	Alternate sides
Highland Ave	McMillan	Melish	6,210	Alternate sides
Sycamore St.	Fourth	Third	400	No interference
Montana Ave.	Epworth	Harrison	470	Under operation
Madison Rd	Woodburn	Elmhurst	6,280	Temporary track
Madison Rd.	Elmhurst	Observatory	8,302	Temporary track
McMillan St	Highland	Reading	750	Under operation
Middleton Ave.	Wood	McAlpin	630	Shuttle car
Sycamore St	And	Parkway	344	Alternate sides
Main St.	And	Parkway	980	Alternate sides
McMicken Ave.	At Vine			Under operation
Highland Ave	At Ringgold			Under operation
McMillan St.	At So	Clifton		Under operation

Progress chart used by Cincinnati Street Railway for 1926 track reconstruction work ing staff brought the city and railway in closer relationship and permitted the work to proceed without serious interruptions.

STANDARD CONSTRUCTION WITH STEEL TIES

The company's standard construction used on the other sections consisted of 7-in. T-rail, section 93-507, installed on M-25 Carnegie steel ties 7 ft. long with No. 23 clips and bolts. These ties were spaced on 3-ft. centers and were mounted on a 1:3:6 concrete foundation, 6 in. thick. Concrete was poured around the ties and up the web of the rail to such a height as would permit of the installation of a brick or Durax pavement. A ¾-in. sand cushion was used under all pavement. All rail joints were thermit welded.

A ½-in. space was left between the pavement and the outside of the head of each rail. The pavement between the rails was laid in an arched formation with the top of the arch ¼ in. below the top surface of the rail and ¾ in. below the top surface of the rail at its connecting point with the rail. Carey elastite filler was installed on either side of the rail.

The arrangement with the city for the company's program of track construction was not completed early enough in the year for the company's own organization to handle the extensive program. It was considered advisable to employ a contractor to take over a portion of the work so that it would be completed before winter weather forced suspension of construction. The work was carried on in an efficient manner by the use of modern excavating, concrete mixing and material handling apparatus.

When the track reconstruction program was arranged for 1926 the maintenance of way department of the Cincinnati Street Railway prepared a program chart incorporating the location and length of each section, together with the expected date of starting and the estimated date of completion. With daily notations this print indicated the actual progress of all work and afforded a means for the department to see the entire situation at a glance. All reconstruction work was carried on without any service interruption. Careful consideration was given to the kind of track pavement to be adopted for each section reconstructed, in order that it would harmonize fully with the adjoining street pavement. Some sections required a Durax pavement in order to obtain this harmonious effect, whereas others required brick. Where neither of these were suitable concrete was used.

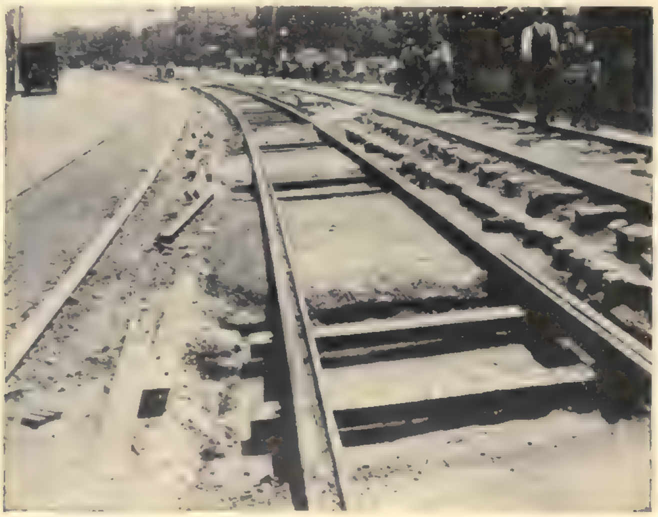
Old concrete foundation on Madison Road after removal of rails and wooden ties

Realizing that unusual noise in any part of the system would cause immediate complaint from the residents of the community affected, the railway gave this subject careful consideration. When the 1926 program was arranged an examination was made of the track sections involved and where there was any doubt whether repair work would eliminate the noise the tracks were completely reconstructed. This matter will be given still greater attention in 1927. Not only were low joints, cupped or corrugated rails considered from a noise standpoint but from a maintainance standpoint as well. It was appreciated that if these defects were allowed to remain the track foundation and pavement would ultimately be destroyed and reflect similar destruction upon the rolling stock. This, of course, would result in higher maintenance costs.

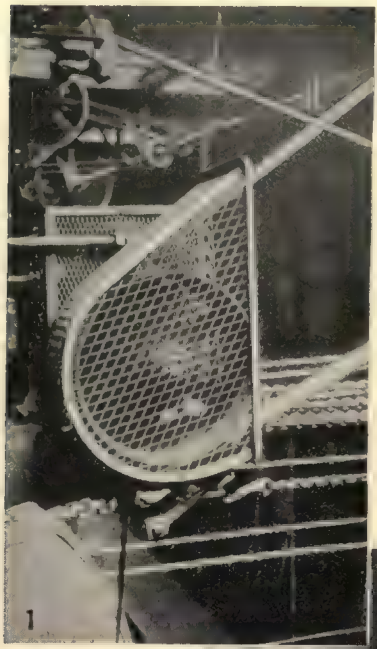
A complete inspection of the track and roadway has been completed for the 1927 program. Plans, specifications and construction schedules are being formulated to carry on the work in an efficient and uninterrupted manner.

Although the franchise does not necessitate the completion of the work before 1930, the company nevertheless is endeavoring to comply with its terms before the specified time.

New steel ties installed in the wooden tie pockets of the old concrete foundation


Temporary track laid on street pavement and method of anchoring track by concrete

Specially Designed Safety Guards Were Arranged for Each Machine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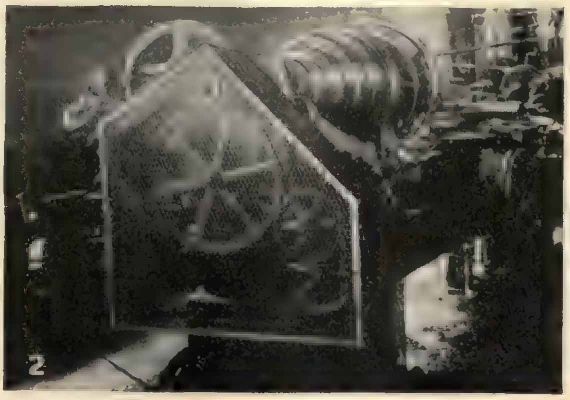
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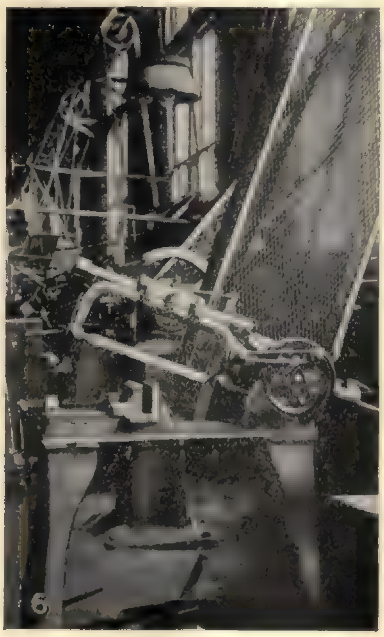
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7

1—Counter shaft belt guard.

2—Rahn woodworking lathe. Gears are guarded completely and opening in the guard permits safe use of shaft end.

3—Small drill press with complicated guard construction.

4—Arrangement of machine shop before guards were installed.

5—Grindstone in the carpenter shop. Driving belt is thoroughly guarded.

6—Motor-driven jackshaft in the carpenter shop. Guards are provided for belt and commutator end of motor. The latter does not interfere with the ventilation of the motor. Commutator guards may be readily removed for inspection and maintenance of brushes and commutators.

7—Bandsaw in the carpenter shop. Belt and saw are protected with guards.

Safety Guards in Wilkes-Barre & Hazleton Shops

Study of Working Conditions Resulted in the Design and Installation of an Elaborate System of Shrouds for Moving Parts

NEAT, rugged and well-designed safety guards recently were installed to protect all moving elements of the machinery in the Hazel Park shop of the Wilkes-Barre & Hazleton Railroad, Hazleton, Pa. The installation of these guards was the direct result of a safety campaign inaugurated some time ago, and to which considerable time and study were devoted. It had for its primary object the reduction and as far as possible the complete elimination of various kinds of accidents within the organization. All departments were analyzed thoroughly, including track, roadway, overhead, overhauling and inspection shops and storehouse.

In the Hazel Park machine shop an intensive study was made of the operations performed by each employee for the purpose of determining possibilities of danger of bodily injury to the men. As a result of this study, a few changes were made in the shop arrangements and methods. Material constantly used for maintenance, as well as all waste materials, was centralized so as to give greater working freedom. Safety guards were installed on all moving elements of the machinery which in any way appeared to endanger life or limb.

The Hazel Park shop is rather narrow. Along one wall are installed various bins, benches and tool closets for the storage of material and tools required for daily use. On the opposite side of the shop, along the windows, are the various pieces of shop machinery, such as drill presses, lathes, wheel press, boring mills, armature repair stands, numerous small machines and work benches. In addition, the master mechanic's office and storage space are also located on this side of the shop. A standard 4-ft. 8½-in. gage track is installed throughout the entire length of the shop, on the storage bin side. A portion at the end of this track is taken up by the babbitting department. When cars are jacked up above the track the aisle space between the car bodies and the shop machinery is very small.

This shop is used to maintain not only twenty motor cars, one freight motor car and one electric locomotive of the Wilkes-Barre & Hazleton Railroad, but in addition 41 motor passenger cars of the Lehigh Traction Company. When the track is filled with cars the men are constantly moving in close proximity to the moving machinery and the possibility of bodily injury is necessarily increased.

All of these factors were carefully considered in connection with the study of the characteristics of each machine. Proper safety guards were designed. It was decided to use No. 8 Steelite wire with mesh varying from ¾ in. to 1 in., depending on the location of the apparatus to be protected and the possibility of danger. A steel angle of ⅛x¾ in. section was selected to support the wire mesh, on account of its ability to retain its shape after being bent in various curves. Each machine was studied individually and a design adopted which took into consideration the thorough protection of its parts, the solid fastening of the guard to the machine, as well as providing for accessibility to the moving parts for repair work with a minimum of disturbance to the guard itself.

To protect large parts where there was little danger of fingers or small particles coming in contact with them, a wire mesh screening 1 in. in diameter was used, but where there was danger of personal injury or of small particles coming in contact with the machine, ¾-in. mesh was adopted.

Accompanying illustrations show the relative location of well storage bins, track and machinery before and after the safety guards were installed. Additional illustrations show the safety guards used for individual machines.

All the guards were manufactured along the same general line, the thought being the incorporation of ruggedness, neatness and maximum of protection. Each piece of screening and angle was cut to size and shaped by means of forms. Each piece of screening was then laid in its proper angle frame. On top of it a reinforcing strip of flat steel ⅛x½ in. was placed and all were held together rigidly with ¼-in. rivets. Where any doubt existed as to there being sufficient strength to the finished product, an additional ¼-in. x 1-in. horizontal metal strip was installed and riveted to the angle framing. Where necessary to arrange for periodic inspection or maintenance, the guards were provided with hinged doors or hand holes. Each guard was fitted with brackets for fastening to the machine being protected. The guards were all manufactured in the Hazel Park shop under the supervision of James Brown, master mechanic.

Eliminating Hazards in Car Operation

A COURSE in safety for platform employees of the transportation department of the Tennessee Electric Power Company was inaugurated by J. J. Connors, safety director. The entire department is divided into groups of fifteen men and regular weekly meetings are held for each class. The method used in conducting these classes is known as the "job analysis method," originated by the Federal Board for Vocational Education.

In analyzing the safe operation of a street car every detail is brought out. It has shown in these classes that an operator performs eight distinct movements in taking on a single passenger. The operations are further subdivided, developing the fact that there are thirteen hazards which may result in accident while bringing the car to a stop. Opening a car door develops four more hazards and five hazards are present in closing it. In starting a car eight additional causes of possible accidents arise, and numerous other hazards are encountered in piloting the car through the city streets.

In the final analysis of the problem there are 119 accident possibilities from the time the operator begins to bring his car to a stop to take on a passenger until he has completed the operation of his car to the next block.

The class, under the direction of Mr. Connors, passes on the different methods for safe operation and the best ones offered are adopted as standard. The result is that nothing can possibly happen in the average operation of a street car but that the operator has some known means of avoiding it.

The Readers' Forum

Cold Steam Process Used for Cleaning

CHARLESTON INTERURBAN RAILROAD
CHARLESTON, W. VA., May 16, 1927

To the Editor:

There should certainly be no doubt in any one's mind as to the value of making cars striking in appearance and clean and comfortable to ride in. In the first place, a color scheme of high visibility is at all times a reminder to the public of the presence of the service and has the same purpose as the "repeat" advertising of national products. The cleanliness and brightness of cars is, of course, an invitation to ride, while dirty, dingy, noisy cars attract no one except those who must take that means to get to their destination.

In my opinion, 90 per cent of the value of modernizing equipment is attained by repainting and putting the car in good mechanical and electrical condition. This is particularly true where the roadbed is in good condition. I believe further that cars of really antiquated design cannot be modernized profitably. To sum up the matter, it is merely a question of adopting a higher standard and a more rigid schedule of maintenance than any railways have adopted in the past. The added features of modernization, such as soft, spring-cushion seats and linoleum-covered floors are all good business getters, but the problem of the smaller railways is to make the 90 per cent improvement and operating results will eventually justify the purchase of the latest types of rolling stock, incorporating these nicer refinements in their original design.

In February, 1926, owing to the death of the president of this company, Arthur M. Hill was elevated to the post of vice-president and general manager. It has only been during the last few months that he has been able to devote very much thought and effort to the question of modernization. He has, however, started a program of repainting and rebuilding and this work is proceeding at the rate of about two cars a month. It is hoped to increase this to at least three cars a month.

We have adopted orange as an outside body color, with natural wood finish on doors and window frames. The inside colors being used are white headlining, light green walls to the window ledges, with a somewhat darker green from the window ledges to the floor. This two-tone green combination has been carried around the interior of the cabs as well. All exposed piping and equipment are being painted the same color as the back wall of the cab to camouflage them, in place of inclosing such parts. Floors are being renewed and painted. In some of the cars we have adhered to the rattan upholstery, while in others we are using an imitation leather. We intend to vary the interior color scheme on subsequent cars merely for the sake of variety, but expect to adhere to a two-tone combination. We believe that this variation should not extend to the outside colors.

We are also paying a great deal more attention to the cleaning of the cars, particularly the inside. An installation for cleaning cars by the cold steam process is being made at the present time.

Although our rolling stock had not been allowed to get in really bad condition, we found that a great deal of effort could be spent profitably on rebuilding of trucks, welding of broken motor frames, building up of housings, renewing worn bearings, repairing compressors, controller parts, etc. At the same time we have renewed such minor parts as worn straps, frayed and knotted bell cords, greasy and torn motormen's curtains, and the like.

A number of our cars need painting and the inclination is to neglect the rebuilding work in order to get out repainted cars on a faster schedule. However, we believe that a great deal of the effect on the public is lost when old, worn equipment is permitted to go out in the same condition except for a new coat of paint.

The city equipment operated by this company is for the most part fairly light weight and of steel construction, so that it is comparatively easy to modernize. We have some older wooden equipment with monitor roofs, weighing more than 900 lb. per passenger seat, and this equipment we do not intend to remodel.

Our own repainting plans have not progressed far enough for us to make a dollars and cents comparison between old and rebuilt equipment. We do not expect any marked improvement in this direction for at least a year because of the fact that we are scattering the rebuilt equipment as widely as possible over the various lines of the system in order not to appear to favor any one line. As there is a more than even chance that a waiting passenger may be forced to board an old car, it is not expected that any considerable number of people will abandon other means of transportation in favor of car service. The real effect will come, we feel, when 60 to 80 per cent of our equipment has been rebuilt.

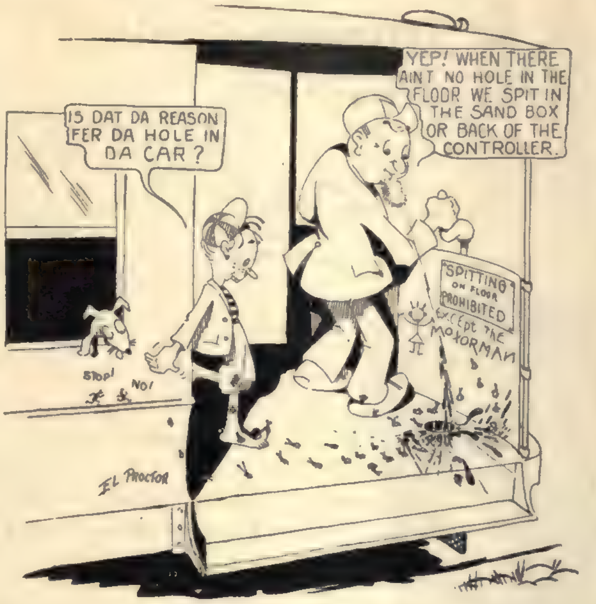
J. E. ALBERT,
Assistant to General Manager.

International Railway Cleans Up and Paints Up

IN LINE with the city-wide spring clean-up campaign the International Railway, Buffalo, N. Y., has painted 134 cars and buses so far this year. The schedule now calls for every car to go through the paint shop at Cold Springs every eighteen months. Particular attention is being directed to the appearance of the Niagara Falls high-speed cars. Simultaneously with advance in fares on the interurban lines a campaign to improve the equipment on the line was begun by the company.

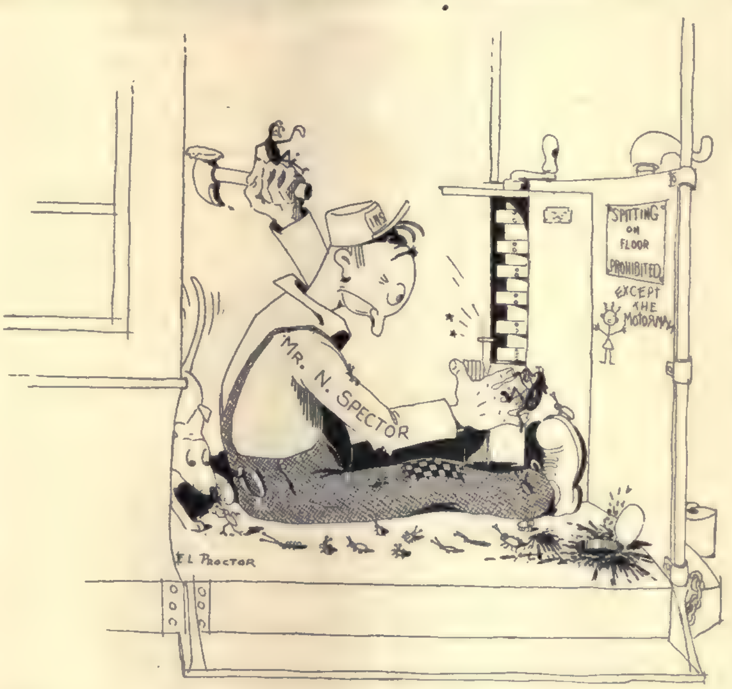
Since the increase has been granted nearly all high-speed cars have been repainted and refinished, and work is now being extended on the Lockport division. The painting schedule calls for refinishing and the placing in the cars of the new announcement of the connection with the Gorge Trip. The cars are finished in a bright yellow, with the lettering along the lower side panels and the front dash in a dark mahogany. The front panels below the motorman's cab carry the wording: "Buffalo-Niagara Falls High-Speed Line." The side panels display the I.R.C. monogram and the new wording: "Buffalo-Niagara Falls High-Speed Line Connecting with Niagara's Great Gorge Trip."

A contract has also been let for equipping the high-speed line throughout with automatic block signals. The I.R.C. electrical force will install the new equipment when it is received.

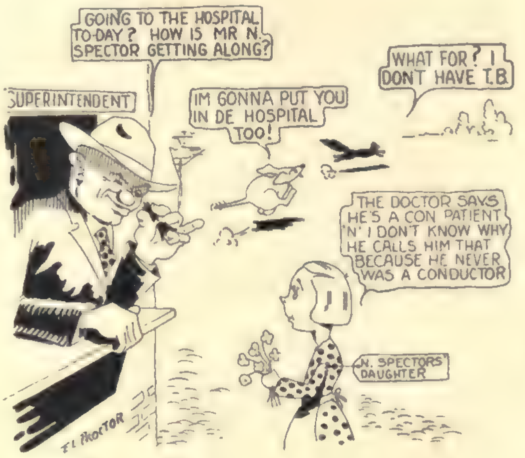

IS DAT DA REASON FER DA HOLE IN DA CAR?
YEP! WHEN THERE AINT NO HOLE IN THE FLOOR WE SPIT IN THE SAND BOX OR BACK OF THE CONTROLLER.
"SPITTING ON FLOOR PROHIBITED" EXCEPT THE MOTORMAN
STOP! NO!
E L PROCTOR

Adventures of Old Man Trouble *on the* Hicksville Railway

May Flowers Look Nicer in the Woods than They Do in the Hospital



The practice of spitting on the floor by car operators not only makes the front end filthy but is responsible for the spread of disease which casts a dark shadow over many happy homes


GOING TO THE HOSPITAL TO-DAY? HOW IS MR N. SPECTOR GETTING ALONG?
SUPERINTENDENT
IM GONNA PUT YOU IN DE HOSPITAL TOO!
WHAT FOR? I DONT HAVE T.B.
THE DOCTOR SAYS HE'S A CON PATIENT 'N' I DONT KNOW WHY HE CALLS HIM THAT BECAUSE HE NEVER WAS A CONDUCTOR
N. SPECTORS DAUGHTER
E L PROCTOR

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

The Judges Who Will Pass Upon the Articles Submitted in "Journal's" Maintenance Competition

WITH the co-operation of Daniel Durie, president of the American Electric Railway Engineering Association, judges who will serve in connection with the ELECTRIC RAILWAY JOURNAL'S maintenance competition have been selected. They include the three chairmen of the standing committees having maintenance work to do. They are A. T. Clark, Baltimore, chairman of the committee on rolling stock; F. McVittie, Rochester, chairman of the committee on power distribution; Howard George, Newark, chairman of the committee on way and structures; Guy C. Hecker, special engineer of the American Electric Railway Association, and Charles Gordon, editor of the ELECTRIC RAILWAY JOURNAL. These men are recognized leaders in the work of their particular departments and as chairmen of the various engineering association committees their standing will lend weight to the decisions they render.

Judges of the "Journal's" Maintenance Competition

Top, left, Howard George; top, right, Guy C. Hecker; center, A. T. Clark, chairman; lower, left, Charles Gordon; lower, right, F. McVittie.

As recognized leaders in the work of their particular departments and as chairmen of the various engineering association committees, the standing of these men will lend weight to the decisions they render

A. T. Clark

Mr. Clark is superintendent of rolling stock and shops of the United Railways & Electric Company, Baltimore, Md. He has been connected with the company there since 1907. He was graduated from the Sheffield Scientific School with the degree of M.E. In the past he has served with the J. G. Brill Company, the Southwark Foundry & Machine Company, the Link Belt Engineering Company and the Bethlehem Steel Company.

F. McVittie

Mr. McVittie is electrical engineer of the New York State Railways, Rochester Lines. He is a Canadian by birth, received his early education in the public and high schools at Rochester, N. Y., and his technical training at Rose Polytechnic Institute, Terre Haute, Ind. For the past twenty years he has been connected with the New York State Railways in various capacities, and in 1917 was appointed electrical engineer of the Rochester Lines.

Howard George

Mr. George is with the Public Service Production Company, Newark, N. J. He took his present post in the fall of 1925. Before that for five years he was engineer of maintenance of way for the Public Service Railway, another subsidiary of the Public Service Corporation. He has been connected with the companies in New Jersey since 1906. He served the company first as field engineer, then as division engineer, assistant to the chief engineer and as engineer of maintenance of way. During the term of his service in this last-mentioned capacity the responsibility was made his for the design and construction work on building operations, his transfer to the production company was a natural result of the widened activities of the man.

G. C. Hecker

Mr. Hecker has been special engineer of the A.E.R.A. since March, 1922. In that post he succeeded J. W. Welsh, now executive secretary of the association. His connection with the industry dates from 1903, when he became connected with the Citizens Traction Company, Pittsburgh. He was advanced eventually to the position of chief electrician, a post that really carried responsibilities much greater than the title he held would indicate. In 1920 he became a general engineer in the railway department of the Westinghouse company and from that position he went to the association. He has to his credit to a scholastic attainment the completion of the course in electrical engineering at the Carnegie Institute of Technology at Pittsburgh.

Charles Gordon

Mr. Gordon is by training a car equipment engineer. He served formerly in this capacity with the Chicago Surface Lines, responsible under H. H. Adams for engineering development in connection with the operation of about 4,000 surface cars engaged in the hardest kind of city service. He entered the railway field in Chicago in 1912, upon his graduation from the electrical engineering department of the University of Illinois, and continued in railway work until the fall of 1917, when he entered the army air service. On his return to civilian life he served with the Vacuum Oil Company for a year, but then became equipment engineer with the Chicago Surface Lines, with office in Chicago. He entered journalism with the ELECTRIC RAILWAY JOURNAL in 1923.

All Articles in This Section Submitted in

Maintenance Competition

THIS section contains the first group of items submitted in ELECTRIC RAILWAY JOURNAL'S maintenance competition. The judges whose names are published on the adjoining page will select one of these for the first $25 prize awarded for the month of May. The winner will be announced in next month's maintenance issue, dated June 18. In addition, the author of each item in this section will receive $5 immediately. The winning article, together with all others submitted before Aug. 1, 1927, is eligible for the capital prizes of $200, $100 and $50 respectively, as previously announced.

Maintenance Men, Don't Overlook This Opportunity of Winning Recognition! There are eleven of these monthly prizes left, besides the three capital prizes. Get your articles in early. That gives you a better opportunity of winning one of the early monthly prizes. Track and distribution men are particularly urged to enter the contest. At present, the equipment department has by far the best showing. Don't complain later that the track and line was not properly represented. This is your contest. Get those maintenance kinks in now! See the April 16, 1927, issue, pages 700 and 701 for full details.

REMEMBER!

ANY employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items suitable for publication in this section.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

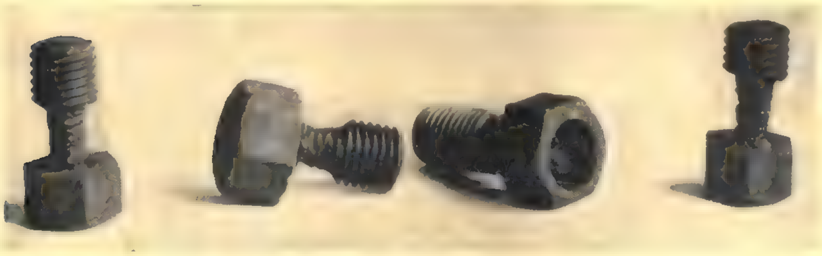
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—13

Method of Removing Broken Cap Screws*

BY P. A. GILBERT

Foreman Welder Rolling Stock and Buildings Department,
Philadelphia Rapid Transit Company, Philadelphia, Pa.



Broken cap screws which have been removed by welding an extension with nut for turning

IN THE maintenance of certain types of motors operated by the Philadelphia Rapid Transit Company considerable difficulty was experienced due to breakage of cap screws holding the axle bearing caps in place. Frequently this breakage occurred in such a way that a short end of the cap screw still remained in the aperture. This prevented the insertion of a new cap screw until the broken portion was removed. To facilitate the removal of these broken ends a special procedure is used in the shops.

First an acetylene torch is used to heat the aperture long enough to burn out any accumulation of oil or grease that may be present. Following this a column of metal is built up on top of the broken end of the cap screw by electric welding. This is brought up to a height so that it will extend somewhat above the top of the aperture. An old nut of proper size is then dropped down over the column of metal and the welding operation is continued until the hole in the nut has been filled up and is thus welded in place. With this method the nut is firmly welded to the broken part of the cap screw through the column of metal, and a wrench can be applied for removal.

An inexperienced welder may have some difficulty in performing this operation, particularly if the aperture is under ¾ in. diameter. To overcome this the end of the electrode is wrapped with friction tape, which serves to prevent it from coming in contact with the side of the hole. The tape, of course, burns off as the arc progresses. It is very seldom that this treatment has failed to remove the broken end of the screw.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

Electric Railway Journal Maintenance Data Sheet

SIGNALS—1

Clearing Indicator Assists One-Man Operators*

By Jay McDonald

Signal Maintainer Chattanooga Traction Company, Chattanooga, Tenn.

A CLEARING indicator which shows the motorman when the signal has cleared behind him is used with all Nachod signals on the lines of the Tennessee Electric Power Company, Chattanooga, Tenn. It has been found of particular assistance in one-man operation. The clearing indicator lamp is the same as is used in the signals. It is inclosed in a small box with a hinged top. The light shines through a 5-in. bull's-eye lens. The color of the lens is optional with the railway. The box which we are using is 7 in. x 7 in. x 4 in. It is placed on a pole about 10 ft. above the ground and far enough from the clearing contactor to be visible plainly to the motorman when the trolley wheel passes under the clearing contactor. The lamp used is a 50-watt, 220-volt size and is wired in multiple with the red light in the signal with two wires each No. 10 solid weatherproof. The clearing indicator shows the motorman when he has cleared the block and also indicates when another car is following him through the block.

In the accompanying diagram an outbound car hitting the setting contactor will set a white light in signal *A* and a red light in signal *B* together with a light in the repeater or indicator. When a car hits the clearing contactor the lights are cleared in the *A* signal, the red light in the *B* signal and the light in the indicator in front of the clearing contactor. The diagram does not show the operation of the white light in the indicator.

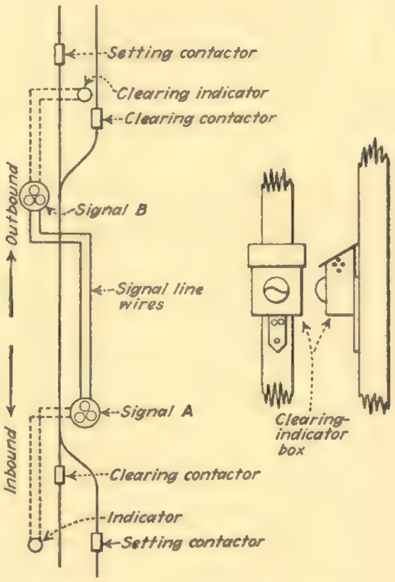

Diagram of connections for clearing indicator

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*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—14

Convenient Hydraulic Bearing Press*

By Equipment Department

Georgia Power Company

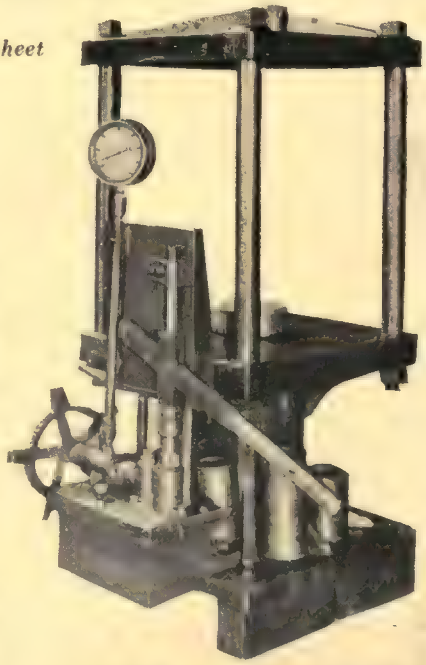
FOR pressing armature bearings into housings, the Georgia Power Company, Atlanta, Ga., uses two hydraulic presses, one at the main shop of the railway and the other at an operating carhouse where armatures are changed.

The base and top plate are made of cast iron. The base contains the pressure cylinder and provides bolting lugs for the reservoir and pump. The top and bottom plates are fastened together with four 1½-in. bolts. Extra heavy pipes of 2 in. diameter are used as spacing sleeves over the bolts. The distance between the face of the ram and the top plate is 21 in. and the travel of the ram is 15 in. The cylinder is lined with a ½-in. sleeve bored out to a diameter of 5 in.

The pump used in connection with the press is a single-acting check-valve type. It is operated by a lever having a four to one ratio. The pump piston rod has a top guide to keep it in line. The pressure release is controlled by a handwheel which is shown at the back of the press in the illustration.

The pressure gage is arranged to indicate from 0 to 30 tons. It is protected by a choke in the pipe, which prevents sudden shock pressures reaching the gage. An assortment of sleeves and mandrels are used to take care of the various diameters of bearings used.

Since the installation of the press at the main shops a saving of 75 per cent in time alone has been realized in the removing and pressing-in operations. The use of the press has eliminated broken babbitt and bruised ends of bearings which, with the previous method, resulted from driving bearings in and out with a hammer and copper block. Another advantage is that positive knowledge is obtained of the fit of the bearing and the pressure used for forcing it into position.



Type of hydraulic bearing press used in the shops of the Georgia Power Company

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*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

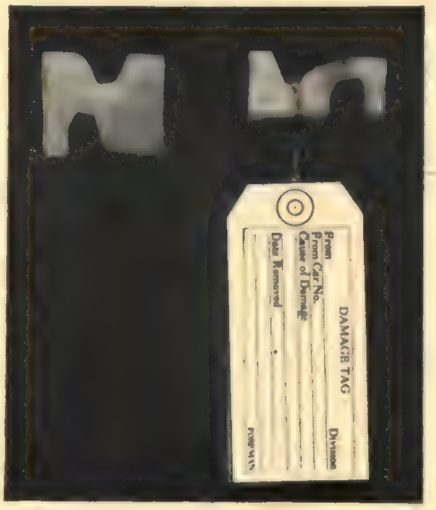
ROLLING STOCK—TRUCKS—5

Parowax Method for Determining Flange Wear*

BY J. B. BLAIKLOCK
Master Mechanic Washington Railway & Electric Company, Washington, D. C.

IN ORDERING cars to the shop for a change of wheels it is sometimes difficult for a carhouse foreman to judge correctly the condition of the flanges and report only those wheels for change that have reached the limit of allowable wear. In order to provide for the removal of wheels at uniform limits of flange wear and so that the various carhouse foremen on the Washington Railway & Electric Company's system can keep the mechanical department office informed properly as to flange wear of wheels parowax impressions are made. The practice of taking these impressions was established seven years ago and has proved quite satisfactory.

The accompanying illustration shows two impressions that were taken and sent in to the mechanical department office. Impressions are made in a piece of ordinary parowax about ⅜ in. thick by 1 in. x 2 in. This size will take care of flange impressions for two wheels. The impression is made by pressing the wax against the flange of a wheel which has first been warmed by means of a blow torch to a temperature just sufficient to soften the wax. The impression is then numbered and dated and is sent to the mechanical department office, where it is examined by the master mechanic, who determines whether the car should be shopped and wheels removed or whether it should be continued in service for a longer period. If the latter course is decided upon the wax impression is filed away for future reference and attention.



Parowax impressions of steel wheel flanges

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

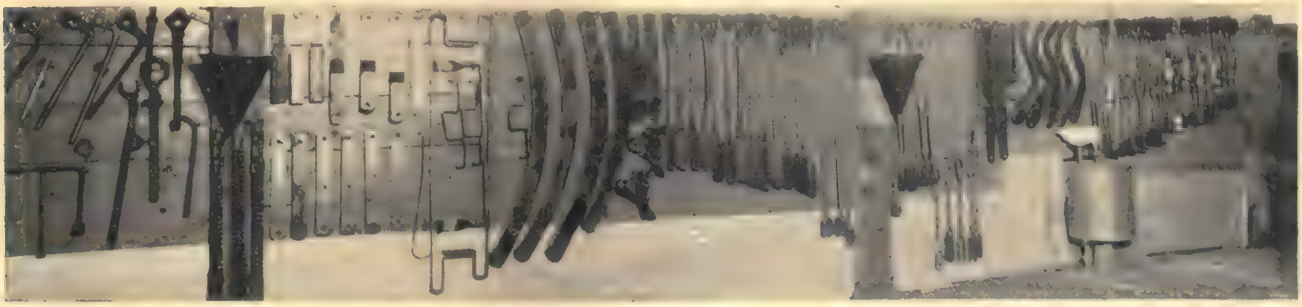
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—7

Tool and Truck Maintenance Parts Board*

BY R. M. O'BRIEN
Superintendent of Rolling Stock and Shops
New Orleans Public Service, Inc.,
New Orleans, La.

A COMBINED tool and truck maintenance parts board which is in use in the Canal shop of New Orleans Public Service, Inc., is proving of great convenience. A check system is not used with this board, as it is under the supervision and care of the foremen. Unless the tool board is completely filled the day foreman will not accept it from the night foreman, and vice versa. This board is located near the center of the shop so that walking distance to it is reduced to a minimum. The visible storage of the maintenance parts tends to make any depletion of stock below certain limits very noticeable to the foreman. This type of board helps materially to improve the appearance of the shops and keeps them neat and clean.



Tools and maintenance parts are kept orderly and neat by means of this type of board

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

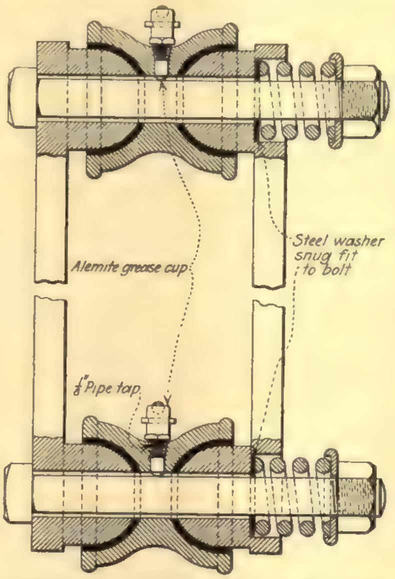
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—6

Alemite Lubrication for Half-Ball Brake Hangers*

By A. Taurman
Superintendent of Equipment, Way and
Structures Birmingham Electric
Company, Birmingham, Ala.

USE of grease cups so as to provide Alemite lubrication for Brill half-ball brake hangers has lengthened the life of these hangers 100 per cent on trucks operated by the Birmingham Electric Company. This has also reduced the wear so that much of the chattering and noise which existed prior to this installation has been done away with. An accompanying diagram shows how these grease cups are attached. The hangers are drilled and tapped for a ⅛-in. pipe fitting at the points where the Alemite cups are placed. The only other change made was to provide a closely fitting metal washer around the bolt at the point where the spring rests against the hanger. With this arrangement the opening at each end was closed effectively. All brake hangers of this type on trucks of the Birmingham Electric Company are being equipped with the Alemite grease cups in this manner.



Application of Alemite grease cups to half-ball brake hangers

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—8

Dolly Truck for Crippled Cars*

By R. T. Chiles
Master Mechanic Cumberland County Power
& Light Company, Portland, Me.

FOR the past two years we have used a specially designed small truck or dolly for bringing in cars with broken axles, broken gears or other troubles that develop in service which prevent a pair of wheels or an armature from revolving. The truck can be placed in position under the car in about twenty minutes and it requires no chains or fastening to hold it. The pair of wheels to be removed from the running rail is jacked up, together with the car body, and the small truck is pushed into position. The wheels are then lowered until they rest firmly on the inside of the side frames.

Small truck used for bringing in crippled car

The motor geared to this axle, or with four-motor equipments the pair of motors, one of which is geared to the axle, is cut out either at the controller or by removing the carbon brushes. The car can then be operated on its own power without difficulty. The small trucks will pass through special trackwork as readily as a standard car wheel. They can be used with any type of double or single truck car and with wheels from 26 in. to 34 in. diameter, and with a rim width of 4 in. Cars have been brought in a distance of 16 miles on this truck at a speed from 12 to 15 m.p.h. without undue heating of the wheels of the truck.

The general construction of the truck is shown in the accompanying illustration. The side frames are of 1-in. by 4-in. steel, the end crossing bars of 3-in. x 3-in. x ⅜-in. angles and the diagonal braces and motor rests of 3½-in. by ¾-in. steel. The wheels of the truck are 5⅝ in. diameter, with 3-in. tread, 1-in. flange thickness and ¾-in. flange height. They were turned up from 7-in. diameter steel billets and have bronze bushings. Axles are 2½ in. diameter and are drilled so that they can be filled with grease for lubrication. The wheel base is 29½ in. and the truck has a length over all of 41 in., a width of 65 in., and weighs 528 lb. The weight of the car is carried on four bolts, each 1½ in. diameter, shouldered between the side frames of the truck.

Truck installed under 24-ton car

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Improved Equipment

Additional Tools for Electric Railway Maintenance

MANY letters of commendation have been received from our readers regarding the value of short descriptions of improved equipment for railway maintenance. We started the publication of such items in the March 19, 1927, issue, in which sixteen pages were included. Some additional items were published in the April 16 issue and now we are adding the third installment. Such descriptions of the latest tools which can be adapted to electric railway maintenance work enable those responsible for maintenance practices to visualize the shortcomings of their particular equipment and provide for changes which will put their maintenance work on a higher plane. Modern tools speed up repairs and assist in making a railway prosperous.

Paint Spraying Gun

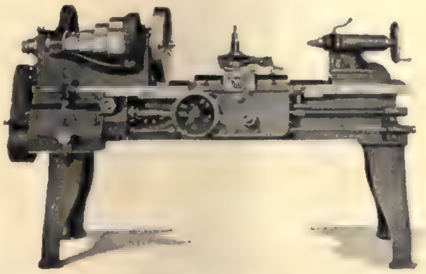
ALEXANDER MILBURN COMPANY
1416-1428 West Baltimore Street,
Baltimore, Md.

EITHER a siphon feed, pressure feed or gravity feed spray can be used in this spray gun. An adjustment in the multiple head produces a horizontal or vertical flat fan spray or a round spray. When dusting is desired a trip lever is raised, allowing the air to blow alone and shut off the paint supply completely. Both the air and paint valves are operated simultaneously. By pulling the trigger paint flows to the atomizing chamber, is expanded and is forced into the pores of the surface to be covered. A self-centering fluid pin is furnished with the gun which increases or decreases the volume of paint. The gun is all metal, evenly balanced and provided with a natural hand grip.

Standard Cone Head Lathe

REED-PRENTICE CORPORATION
Worcester, Mass.

SIXTEEN-INCH standard lathes of this manufacture have four step cones, which in conjunction with gearing of suitable pitches adapts these lathes for a wide range of light and heavy work. The head spindle is made from a steel forging with journals hardened and ground. The spindle bearings are square cast-iron housings which fit snugly into square seats in the headstock. They are lined with babbitt, bored with a diamond and hand-scraped to the spindle. A compound rest is usually furnished with the machine but a plain rest can be furnished if desired. Power cross feed is furnished with both types of rests. An independent feed rod is furnished so that the lead screw is used only for thread cutting. Each machine has a quick change gear box providing 60 changes to both lead screw and feed rod. There are two 13-in. friction pulleys on the countershaft and of a width suitable for a 3½-in. belt. The standard equipment consists of a countershaft, steady rest, tool post, large and small face plates, thread-chasing dial and all necessary wrenches. Motor drive is furnished if desired.



Imperial Under-Cutter

MARTINGALE ELECTRIC COMPANY
Box 2660, Lakewood Branch, Cleveland, Ohio

SIMPLICITY of adjustment is a feature of this improved model of the Imperial Under-Cutter. It is claimed to do rapid, clean cutting and to run without vibration. It will cut either the "V" shaped or "U" shaped slot. It has a micrometer screw to adjust the "V" shaped slot guide and a "V" shaped roller guide to ride in an adjacent slot to guide the cutter. A depth gage regulates the depth of slot and a micrometer screw adjusts depth of gage. This cutter is self-cleaning at all times and automatically prevents under-cutting too deep. It practically avoids the possibility of leaving strips of mica along the edges of the bars flush with the commutator surface. Furthermore, it obviates the necessity of going over the commutator the second time to clean out the slots and remove the strips of mica left by square tooth saws. The danger of short circuits between bars is eliminated. The under-cutter is operated by a ½-hp., 750-r.p.m. motor and is capable of working at the rate of approximately 1 in. per second.

Sliding Head Drills

NILES TOOL WORKS COMPANY,
Division of Niles-Bement-Pond
Company, Hartford, Conn.

SLIDING head drills of the type illustrated have their spindles made of high carbon steel, finished by grinding. There is a ball bearing thrust, quick advance and return. The tool is driven by semi-steel bevel gears of three to one ratio. The spindle speed is graduated and eight speeds are provided. The feed box is located directly on the head and the gears are of hardened steel and run in oil. Handles for changing speeds are stamped with figures to show advance of spindle in thousandths of an inch per revolution and are located within full view and convenient reach. An automatic stop and depth gage is also provided. The sliding head has a long bearing on the column and slides on wide ways

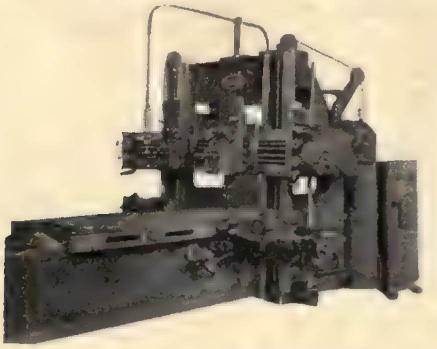
by means of a rack and pinion. The frame has a ribbed and planed base, a large column finished by grinding, a yoke with all gears guarded, a back brace and belt shifter. The table revolves on its center and can be swung out of the way so that the work may be placed on a base plate. The drive is by a four-step cone and sliding back gears operated by a lever. This machine is made in sizes 24, 26, 28 and 32 in.

Planer

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

ONE of the distinct features on this type of planer is the electric feed and traverse controlled by the pendent type switch and levers shown on the gear box at the end of the rail. Single four-position levers, one for each head, control the direction of feed or traverse. These levers, as well as the lever at the top of the gear box for elevating and lowering the cross rail, are all thrown in the direction of motion desired.

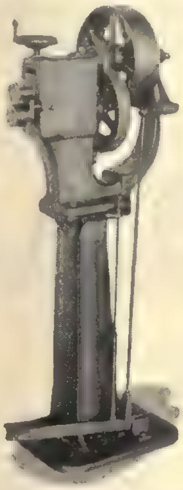
The feed and traverse motor is controlled by the pendent switch and the actual distance the heads or rail travel can be controlled either from the pendent switch or by the levers, whichover is more convenient. The amount of feed is set by a direct reading dial shown on the gear box and ranges from $\frac{1}{32}$ in. to 1 in. Electric feed and traverse through the motor on the end of the rail make for simplicity, as the usual feed box in the bed has been eliminated. A self-contained gear box flooded with oil contains all the feeding and traversing mechanism. The control levers are duplicated at the ends of the cross rail, so that with the pendent switch swinging to any position the operator has full control of the traverse and automatic feed engagement of the tool heads, the cross rail elevating, lowering and clamping, as well as control of the table for setting up work from whichever side of the machine is more convenient. The side heads have independent electric feed, also rapid power traverse for raising and lowering. The side head tool can be brought up close to the rail head tool. Also, the rail head and side head tools are in the same vertical plane so that extra length of stroke is not required when using the side head. All driving gears in the bed and the table rack are made of steel and are of the Maag type. They run in oil, and in addition have oil pumped through directly to them. The oil pump is driven from the driving gears in the bed and also furnishes forced lubrication to the table ways. These machines are made in sizes from 36 in. to 72 in.



Machine for Filing and Beveling Cross-Cut and Rip Circular Saws

WARDWELL MANUFACTURING COMPANY
110-112 Hamilton Avenue, Cleveland, Ohio

FILING and beveling cross-cut and rip circular saws of diameters from 6 in. to 18 in. can be done by the model Y machine shown. It can be operated by a direct-connected motor or belt drive as desired. This machine will automatically sharpen saws at a speed of 70 ft. per minute and it is claimed that hand work cannot equal it in accuracy.



No. 1A and No. 2 Oxygraph

AIR REDUCTION SALES COMPANY,
342 Madison Avenue, New York City

CUTTING of steel of any thickness from $\frac{1}{4}$ in. to 20 in. is accomplished with speed and precision on the Oxygraph. The pantograph principle is employed with a motor-driven cutting torch, to copy a drawing, pattern or templet. The pantograph frame of the No. 1A Oxygraph supports a machine torch and an electric motor driving a tracer wheel which acts as a tractor to propel the pantograph in any horizontal direction desired. The relation between the tracer wheel and the machine torch is such that a drawing or pattern is reproduced to half scale.

The No. 2 Oxygraph shown is designed for larger and heavier work and has two pantographs which support a horizontal bar mounting one or two machine cutting torches, the motor and the tracer wheel. Designs are reproduced on the No. 2 Oxygraph to full scale. Machine torches of great power have been developed for oxyacetylene and oxyhydrogen cutting with the Oxygraph that operates successfully on the heaviest work.

The cutting action of the torch flame is smooth and rapid, and as any shape can be cut it is comparable to a metal saw of great power, capable of cutting steel 15 in. thick at the rate of 4 or 5 in. per minute, following straight lines, curves and angles, acute or obtuse. Cutting may be started at the edge or within the edge of a piece if conditions require it. The Oxygraph torch flame quickly perforates and thus the cost of drilling and handling is saved. The edges of the cut pieces are square and smooth and in many cases no machining is required for finish. If extreme accuracy is required, the cutting can be done so close to the line that the machining is a light finishing operation only.

Wheel Lathe

NILES TOOL WORKS COMPANY,
Division of Niles-Bement-Pond
Company, Hartford, Conn.

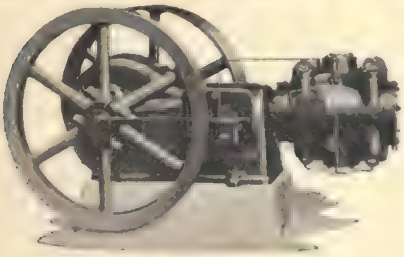
WHEELS from 18 in. to 42 in. diameter on the tread can be turned in this machine. The bed is of a box section casting strengthened by box braces. On the bed are mounted two heads and the tool rests. The left-hand head carries the main driving mechanism, whereas the right-hand head is movable along the bed by a ratchet lever. This head is adjusted to a sliding fit and is clamped to both sides of the bed by a single lever. All driving gears are inclosed and are provided with an automatic lubricating system. The headstock is so arranged that either d.c. or a.c. drive box may be applied.

The faceplates are mounted on spindles. T-slots carry the semi-automatic sure-grip drivers which engage the tires directly and enable the full power of the motor to be utilized at the tools. Thrust of the faceplates is taken by the rear spindle bearings with three friction washers. The left-hand faceplate has fast speeds for facing hubs and turning journals or boring car wheels. However, special attachments are necessary for these operations. The faceplates are driven by bolted gears, which engage with steel pinions mounted on a shaft that extends through the center of the bed. The tool rests have in-and-out adjustment on their bases, which in turn have longitudinal adjustment on the bed. The feed is positive and the range per revolution of faceplate is obtained by six feeding strokes, giving practically a continuous speed. A calipering attachment enables the operator to measure the diameter of the wheel without leaving his position at the tool post. All exposed gears are guarded. The machine can be driven by belt or by a variable or adjustable speed motor, as desired.

Belt-Driven Air Compressor

SULLIVAN MACHINERY COMPANY
122 South Michigan Avenue, Chicago, Ill.

ONE of a line of single-stage wafer valve-type air compressors is shown herewith. The single air cylinder carries the belt pulley on one end and a flywheel on the other. The connecting rods are of open-hearth steel, and are strong and reliable. The babbitt linings are made in halves, and the connecting rod is furnished with wedge-adjusted bronze boxes. The die-cast babbitt bearings of the shaft are carried by seats, facilitating replacement. All parts are accessible. The air cylinder and head are water-cooled. Air cylinder lubrication is accomplished by means of an oil pump connected to the crankshaft. All other moving parts are lubricated by the splash system. An automatic unloader assures constant air pressure. Where the floor space is limited, an idler pulley and bracket can be furnished. These machines run in capacity from 68 to 1,472 cu.ft. They are rugged, simple, compact and economical to operate.



Geared Head Engine Lathe

MANNING, MAXWELL & MOORE, INC.,
Putnam Machine Works, Fitchburg, Mass.

POWERFUL and heavy lathes of this type are made in sizes 36 to 42 in. The deep box section bed is designed with a longitudinal central truss having a cast rack against which the tailstock is braced. The headstock can be driven by a belt, a constant speed motor or an adjustable speed motor. It is of the all-geared type, entirely inclosed, and driven through a friction clutch, mounted on the initial driving shaft. The machine is started and stopped from the apron. Eighteen spindle speeds of a selective type are obtained by the manipulation of only three levers. The headstock contains eighteen gears to obtain the eighteen spindle speeds. A pump provides oil for lubrication of all bearings and gears. The pump and oil tank are located externally on the back of the lathe.

The tailstock is kept in alignment with the head by an inverted V on the rear and has a flat bearing on the front. It has a floating binder to insure correct alignment of the spindle. The four clamping bolts are all operated from the front or working side of the machine. The tailstock is equipped with a side bracket with gear attachment to move it along the bed. The carriage is scraped to fit the entire length of the bed. Each machine has a screw cutting dial, so that all threads can be cut without reversing the lead screw. The compound rest has a swivel base and is graduated in degrees. A unit quick change gear box is bolted and doweled to the front of the bed. It provides 32 changes of threads and feeds in connection with the gearing from the headstock. The steady rest, as regularly furnished, has a capacity of 2 in. to 15 in. diameter on the 36-in. lathe, and from 4 in. to 20 in. diameter on the 42-in. lathe.

Taper attachments, rapid power traverse, cutting compound, circulating system, or metric screw cutting equipment can be furnished if desired.

Dick Prescott Faces the Issue

With Some Misgivings

DICK PRESCOTT, assistant superintendent in the Consolidated Railway & Light Company's shop, quickly realized the seriousness of the situation which Bill Johnson, truck shop foreman, reported. The men refused to go to work. So Steve White, his old friend, the carpenter shop foreman, had been right! Those murmurings he had heard among the men had meant real dissatisfaction and not merely idle gossip of loose tongues.

There was suddenly in Dick's mind an intense feeling of depression and weariness. He had tried to play fair with the men and was thoroughly unprepared for anything of this sort. Had he expected too much? Had he relied too much on his faith that men like to work in a well-managed shop and will take pride in being part of a progressive organization?

"Surely this can't be true," thought Dick. "These men are not objecting to the improvement in efficiency and methods which have been made in the shop. No man with the slightest pride in his make-up would be content to go back to the old shipshod and wasteful methods. I am sure that some of these fellows were getting really enthusiastic about the new order of things and the improvements that have been made in the shop."

There Dick was baffled. He was at a loss to explain any cause of dissatisfaction. Nothing had been done which was not obviously for the improvement of service, reduction of cost or elimination of needless loss in time. Apparently something had suddenly gone wrong. There must be some misunderstanding. Dick refused to lose his confidence in the men and in their fairness of mind when given an opportunity to understand that their interests and those of the company were identical.

These thoughts flashed through the young assistant superintendent's mind quickly. For a moment only he sat silent after Bill Johnson had bluntly reported trouble among the men. There came the idea of appealing to his superior, Tom Mullaney, for aid. He longed for an opportunity to consult with Steve White. But Johnson stood at his elbow and Dick refused to show even the slightest sign of weakness in dealing with this first real test of his ability as an executive. He had been fair and square with the men and he decided to face the issue with them directly, taking the full responsibility for his action.

"Just what seems to be the trouble, Bill?" he asked, calmly.

"Don't know," replied the truck foreman. "Men standin' around lookin' at each other, but won't go t'work."

Dick suspected that Johnson knew more or suspected more than he was ready to talk about. "All right," he remarked, "I'll go right down with you."

As the two men walked into the truck shop, Pete Welsher, shop inspector, whose underhanded work had finally brought on real trouble, puttered around a truck in the far corner of the shop with a sneer on his face.

"Now let's see what this smart young bird's goin' to do," he muttered to himself. "He didn't learn nothin' about this in college, I'll bet."

Association News & Discussions

C.E.R.A. Master Mechanics Hold Two-Day Session

Inspect Shops of Pittsburgh Railways, Westinghouse Air Brake Company and Westinghouse Electric & Manufacturing Company—Further Progress Made in Standardization of Freight Equipment

ATTENDANCE at the Pittsburgh meeting of the Central Electric Railway Master Mechanics' Association on May 11 and 12 was the largest since its organization. This was likewise one of the busiest meetings ever held by the association. The two days were crowded full with the business session and inspection trips to carhouses and shops of the Pittsburgh Railways, the Wilmerding plant of the Westinghouse Traction Brake Company and the East Pittsburgh plant of the Westinghouse Electric & Manufacturing Company.

Every minute of time was occupied in covering the strenuous program laid out by those in charge of the arrangements. During the business session reports of standing committees were gone over, discussed in detail and adopted or referred back with suggestions for further work. Much progress was made in determining standards for freight car equipment in interchange service.

Some slight changes in the details of design of the standard C.E.R.A. box car were adopted. The standard length of coupling hose was changed from 22 in. to 18 in. A set of standard car inspector's gages was approved. A. W. Clarke of the American Car & Foundry Company reported progress in getting approval from the Interstate Commerce Commission of standard safety appliances for interurban box cars. Chairman T. H. Nicholl of the standards committee was complimented by President G. R. Green for the exhaustive and carefully prepared report that was brought in by his committee.

A report of the uniform charges committee was read by Secretary Earlywine. This was received with no objections. The arbitration committee, under the chairmanship of J. B. Corderman, brought in a report regarding a dispute on charges between two member companies that had been referred to it. The decision of the committee was approved by the association.

There ensued a discussion of troubles with the Form 12 coupler resulting from the rough handling of trains or the movement of trains longer than the capacity of the coupler. H. Cordell reported that he had materially reduced this coupler trouble on the Chicago, North Shore & Milwaukee Railroad by the use of a heavier draft spring made up of rectangular steel in place of the round material normally used in this model coupler. A question regarding the operation of so-called 3-in. tread cast wheels that do not actually measure 3 in. was raised by A. J. Challeen. It was voted that such wheels should be rejected for interchange movement.

In the inspection of shops and carhouses of the Pittsburgh Railways the new car washing machines developed and being installed by that company proved to be of great interest. Painting processes used by the Pittsburgh property and the Moorite process of paint removal, which was originally applied in Dallas, Tex., and described on page 292 in the Feb. 13, 1926, issue of ELECTRIC RAILWAY JOURNAL, aroused considerable comment.

The morning of the second day was spent in the Westinghouse Air Brake plant at Wilmerding. After going over the plant and inspecting the manufacturing processes the principal features of brake equipment in use on C.E.R.A. freight and passenger equipment were explained, discussed and inspected. Demonstrations of valve grinding were made for the visiting mechanics by expert workmen. Luncheon was served in the Westinghouse Electric plant in East Pittsburgh and the master mechanics were the guests of that company for the remainder of the day. Those parts of the plant which were of most direct interest and which could be covered in the short time available were inspected.

C.E.R.A. master mechanics at Westinghouse Air Brake Company plant, Wilmerding, May 12, 1927

First row, left to right—John B. Wright, West. Air Brake; A. A. Crawford, Youngstown & Ohio River R.R.; N. M. C. Horner, West. Air Brake; R. S. Bull, Pitts. Rys.; T. H. Nicholl, Union Traction Co.; G. R. Green, Chicago, So. Bend & Northern Ind. Ry.; P. V. C. See, Northern Ohio P. & Lt. Co.; E. J. Jonas, Cincinnati St. Ry.; John Zoll, Louisville Ry.; A. J. Challeen, Detroit United Rys.

Second row, left to right—F. G. Hickling, West. Elect. & Mfg. Co.; Charles Gordon, ELECTRIC RAILWAY JOURNAL; Lawrence Wilcox, West. Tract. Brake; A. F. Rolston, Columbus, Delaware & Marion Elec. Co.; J. A. Duffy, M. W. P. P. S. Co., Fairmont, W. Va.; B. A. Hupp, M. W. P. P. S. Co., Fairmont, W. Va.; O. F. Kemper, West. Ohio R.R.; C. F. Dennis, G. C. Kuhlman Car Co.; L. P. Morris, West. Elect. & Mfg. Co.

Third row, left to right—R. E. Miller, West. Air Brake; B. M. Hartsock, West Trac. Brake; A. W. Reddersen, Indiana Service Corp.; J. B. Corderman, Lima Toledo R.R.; F. A. Bundy, Lima Toledo R.R.; C. E. Keefer, Altoona Logan Valley Elect. Ry.; J. D. Barnhart, Illinois Tract. System; W. I. Conant, Ill. Tract. Syst.; M. W. Barnell, Cincinnati, Hamilton & Dayton Ry.; H. Cordell, Chi., North Shore & Mil. R.R.; W. B. Renshaw, and W. H. Beattys, Jr., West Tract. Brake Company.

Fourth row, left to right—F. P. Snyder, Oakwood St. Ry., Dayton; J. A. Robinson, Consol. Car Heat. Co.; A. B. Wood, West. Air Brake; W. M. Bisel, West. Tract. Brake; G. W. Sword, Oakwood St. Ry.; W. G. Brooks, West. Elect. & Mfg. Co.; M. M. Lloyd, Chi., South Shore & S. Bend R.R.; H. J. Meyer, Beaver Valley Tract. Co.; J. W. Osborn, Cleveland, Southwestern Ry. & Lt. Co.

Fifth row, left to right—A. W. Clarke, Am. Car & Fdry. Co.; L. E. Earlywine, secretary C.E.R.A.; Chas. Sigler, Winona Railroad; R. S. Torgerson, *Electric Traction;* B. W. Sullards, Van Dorn Coupler Co.; R. A. Whisner, Dayton-Xenia Ry.; F. Schmitt, South. Ind. Gas & Elect. Co.; J. H. Trissler, Monongahela West Penn Pub. Service Co.; F. C. Martin, Wheeling Traction Co.; R. Boiselle, Westinghouse Tract. Brake Co.

Top row, left to right—O. L. Franzer, Gary Rys.; R. E. Cornwell, C., S. B. & N. I. Ry.; H. F. Coleman, Ind. Service Corp.; T. W. Cox, I., C. & E. Tr. Co., Springfield, Ohio; C. W. Duncan, Greenfield, Ind.; A. Brownworth, L. S. E. Ry., Sandusky, Ohio; C. C. Kantner, Western Ohio Ry.; J. R. Robinson, Monongahela West Penn Ry.; W. L. Margetts, Gen. Elect. Co.

At noon on Wednesday the visiting mechanical men were the luncheon guests of the Pittsburgh Railways and at dinner they were entertained by the two Westinghouse companies. Speakers at the Wednesday evening dinner included W. T. Rossell, general manager Pittsburgh Railways; President G. R. Green, Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad; J. D. Barnhart, master mechanic Illinois Traction System; T. H. Nicholl, superintendent motive power Union Traction Company, and P. V. C. See, superintendent of equipment Northern Ohio Power & Light Company. Lawrence Wilcox of the Westinghouse Traction Brake Company acted as toastmaster.

Mr. Rossell declared that the industry is moving forward and is making progress in many directions. The new cars in Springfield, Mass., and Joliet, Ill., are signs of the times, he said. Every property is making some progress. Each excels in some things. It is important, therefore, he said, that every effort be made to keep abreast of improvements made by other properties and to apply these new ideas. He felt that every progressive management should send its men out on frequent inspection trips. "No one property can lead in all things," he said, "and it is therefore important that we learn from each other." In the effort to improve maintenance practices on the Pittsburgh Railways, it was found that maintenance requirements alone are so complicated and give opportunity for such important economies that it has been considered wise to avoid adding the additional complication of manufacturing activity. For that reason all possible manufacturing work is being eliminated in favor of better organized maintenance.

President Green expressed appreciation of the courtesies extended by both the manufacturers and the Pittsburgh Railways. He called attention to the progress made by the association and to the valuable work which it is doing in facilitating the movement of interchange freight in the entire C.E.R.A. territory. Henry Cordell said that if managers generally understood the value to master mechanics of getting together for the interchange of ideas and the inspection of others' practices meetings of this kind would receive wider support.

The next meeting will be held on Sept. 8, 1927, in South Bend, Ind.

Bus Convention to Be Held at Philadelphia

THE first annual convention of the Motor Bus Division of the American Automobile Association will be held at Philadelphia at the Ritz-Carlton Hotel on June 15 and 16. One of the important addresses will be made by A. J. Brosseau, president Mack Trucks, Inc., and chairman highways committee, National Automobile Chamber of Commerce. Mr. Brosseau will speak on "The Field of the Motor Bus."

Other speakers on the program include H. G. Wells, member Public Utilities Commission of Massachusetts, who will speak on "Interstate Regulation of Motor Vehicles"; F. J. Scarr, consulting motor transportation engineer and formerly in charge of the Pennsylvania Railroad's auxiliary motor vehicle service, whose topic is "The Relation Between the Motor Bus and Steam Railroads"; Prof. Henry R. Trumbower of the University of Wisconsin, formerly economist of the U. S. Bureau of Public Roads, who will speak on "The Economics of Highway Transportation," and C. T. McConnell, vice-president Ohio Motor Bus Association, whose topic is "System a Prerequisite of Successful Bus Operation."

Appointments in Pennsylvania Association

SECRETARY H. A. BUCH of the Pennsylvania Street Railway Association announces that J. E. Wayne, vice-president and general manager York Railways, has been appointed vice-president of the association and S. S. Crane, vice-president and general manager Altoona & Logan Valley Electric Railway, has been appointed to the executive committee.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 31-June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 9-11—**Midwest Electric Railway Association, annual meeting, St. Louis, Mo.**

June 13-16—**National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.**

June 15-16—**American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24—**American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

Canadian Convention Program Announced

DETAILS of the program for the 23d annual convention of the Canadian Electric Railway Association have been made available by Secretary Eustace Smith, Jr. Headquarters will be at the Fort Garry Hotel, Winnipeg, Manitoba, and the convention will be held in the Winnipeg Rink.

Sessions will begin at 10 a.m. on Tuesday, Wednesday and Thursday, May 31, June 1 and 2. The program follows:

Tuesday, May 31

9 a.m. Registration.
10 a.m. Business meeting.
11 a.m. Reports of committees: Motor bus and truck; safety and accident prevention; rail corrugation; publicity and merchandising of transportation.
12:30 p.m. Discussion of timely topics: "Car Inspection and Noise Reduction," led by C. Comba, Calgary, and J. E. Watkins, Winnipeg.
1 p.m. Luncheon; official welcome by Mayor R. H. Webb; address by a representative of the American Electric Railway Association.
2:30 p.m. Inspection of exhibits.
4 p.m. Trip to Windsor Park golf course.
9:30 p.m. Supper dance, Fort Garry Hotel.

Wednesday, June 1

9 a.m. Paper, "Economical Distribution of Power," by A. J. Westman, Montreal.
Discussion led by R. A. Brown, Calgary.
11:30 a.m. Discussion of timely topics: "Methods of Conducting Energy-Saving Campaigns," led by D. W. Houston, Regina, and F. D. Burpee, Ottawa.
Trolley Wire, Relative Merits of Phosphor Bronze and Cadminum," led by J. F. Neild, Toronto, and E. V. Caton, Winnipeg.
12:15 p.m. Paper, "Electric Railway Freight Handling," by T. H. Stoffel, Westinghouse Electric & Manufacturing Company.
1 p.m. Luncheon; Speaker, Carl W. Stocks, editor BUS TRANSPORTATION.
2:30 p.m. Inspection of exhibits.
7:30 p.m. Cabaret dinner-dance, Fort Garry Hotel.

Thursday, June 2

9 a.m. Paper, "The Development of Miscellaneous Revenue," by W. H. Boyce, Pittsburgh, Pa.
Discussion led by C. H. Dahl, Winnipeg, and G. E. Waller, Hamilton.
11:45 a.m. Discussion of timely topics: "Depreciation of Buses and Trucks, by Age or Mileage," led by D. E. Blair, Montreal, and W. A. Ernst, Grand River.
"Zone Fare Collection on Interurban One-Man Cars and Buses," led by H. E. Weyman, Levis, and M. C. McElligott, Canadian Cleveland Fare Box Company.
12:30 p.m. Election of officers and general business.
1 p.m. Luncheon.
2:30 p.m. Inspection of exhibits.

For the entertainment of the ladies on Tuesday, there will be an automobile trip beginning at 4 p.m., returning to Fort Garry Hotel for tea. On Wednesday automobiles will leave the Winnipeg Rink and the Fort Garry Hotel at 11:30 a.m. for the Motor Country Club, where luncheon will be served.

In connection with the convention there will be exhibits of electric railway and bus equipment. Some 25 exhibitors already have reserved space of approximately 10,000 sq.ft.

The personnel of the exhibits committee is F. J. Pratt, purchasing agent Winnipeg Electric Company, chairman; E. H. Smith, Canadian Westinghouse Company; Norman Franks, Canadian General Electric Company; A. L. Brown, Northern Electric Company. C. H. Clancy, Toronto, is director of exhibits.

The entertainment committee consists of M. C. Gilman, Winnipeg Electric Company, chairman: F. A. Becker, Canadian General Electric Company; G. E. Miles, Canadian Westinghouse Company; D. D. O'Toole, Northern Electric Company; W. H. Reynolds, E. F. Phillips Electrical Works, Ltd.

An innovation this year is a booth in which will be displayed statistical charts, publicity data, bulletins, etc., which have been issued by the association during the year. The booth will be in charge of J. C. Barker of Toronto.

Radio Interference Studied in New England

RADIO interference and public relations problems featured a well-attended and enthusiastic meeting of the New England Street Railway Club at Boston on May 12. Much discussion occurred concerning practical methods of making the fan's life happier through location of faults in his own equipment and the improvement of operating conditions on cars and lines. President Robert B. Stearns occupied the chair. The meeting was held, as usual, at the Copley Plaza Hotel and brought out a large number of operating men interested in radio reception and the effect of various classes of disturbance upon it. Following the regular dinner, Hon. Lewis Goldberg of the Massachusetts Department of Public Utilities gave a straightforward address upon public relations, outlining the problem of bus versus street car service as it confronts the commission, pointing out the policies leading to the development of good public relations and emphasizing the economic aspects of the Massachusetts system of rate regulation, with special reference to the determination of the rate base in public utilities. Conspicuous in the afternoon proceedings was an address by C. W. Horn, superintendent of radio operation Westinghouse Electric & Manufacturing Company, outlining recent progress in the radio art. Written discussions were contributed by James Thompson, signal department, United Electric Railways, Providence, R. I.; J. B. Crawford and Harry Elliott of the Concord Electric Railways, and E. F. Bickford, electrical engineer, Eastern Massachusetts Street Railway, Boston. Abstracts of these papers and discussions will appear in a later issue.

Transportation to Canadian Convention

PREPARATIONS have been made to attach a special car to the Canadian National Railway train leaving Toronto at 9 p.m., Eastern standard time, on Saturday, May 28, for Winnipeg. The train will arrive in Winnipeg about 10 a.m., Monday, May 30. There will be a reduction in fare on this train if ten or more applications are received. Those desiring accommodations should communicate at once with Eustace Smith, Jr., secretary Canadian Electric Railway Association, Toronto, Canada.

Arrangements have been made so that exhibits may be shipped from the United States in bond duty free for exhibition purposes only. Shipments should be addressed to the exhibitors, care of Winnipeg Rink, Langside Street, Winnipeg, Manitoba, for C.E.R.A. convention. Notification should be sent to George H. Young & Company, customs brokers, 303 Confederation Life Building, Winnipeg, accompanied by two invoices. Further information can be obtained from Chairman F. J. Pratt of the exhibits committee, Winnipeg Electric Company.

American Association News

T. and T. Program

THE program committee of the Transportation and Traffic Association held a meeting at the office of the Cleveland Railway on May 6. Those present were: W. H. Boyce, chairman; A. R. Myers, Paul E. Wilson, W. F. Weh, R. W. Emerson and J. W. Welsh. The committee discussed plans for the coming convention and finally agreed on a number of recommendations which it will make to the executive committee of the Transportation and Traffic Association at its next meeting. If the recommendations of the committee are approved the major part of each session will be devoted to discussion of one of the reports of the three major committees. It is planned to devote Monday to bus operation, Tuesday to traffic and safety and Wednesday to service betterment.

A suggestion will be made that a very brief entertainment period be provided for each session, probably in the form of a musical recital. In addition one or more speakers will be scheduled for each session. It was also suggested that at one of the sessions a demonstration be given of the bus schools of the Northern Ohio Power & Light Company.

If the plan of the program committee is carried out the committee reports will neither be read nor approved, but instead the program committee will list the outstanding points or phases of the report as topics for discussion with a predetermined list of speakers.

Purchases and Stores

WITH almost a full attendance, the committee on purchases and stores met at association headquarters in New York City on May 16. Among the important subjects discussed were: "Review of Existing Purchases and Stores Section of the Manual for Revisions and Correction"; "Continued Study of and Recommendations Regarding the Disposal of Unused Inactive Material"; "Study of Routine Methods to Be Followed in the Purchase and Stores Department Recommending that a Report be Made on the Uniform Method of Distributing Material by Supply Trains or Trucks"; "A Uniform Practice of Testing or Inspecting Material on Receipt or at Factory."

After some discussion and favorable comment, the sub-committee's report on subject No. 2, "The Disposal of Unused and Inactive Material," was permitted to stand as previously adopted.

When discussing subject No. 3, which included a routine method to be followed in receiving, tracing and expediting material, a letter from W. E. Scott of the Philadelphia Rapid Transit Company was presented in which he urged that it should be the function of the stores department to follow up and expedite the delivery of material. Mr. Scott was sustained in his argument by C. A. Harris of the Philadelphia Company. So important were the points brought out by these committeemen that Chairman Fleming suggested that their remarks form the basis for a minority report to be submitted at the next annual convention of the association.

At the afternoon session the question of testing and inspecting materials caused considerable discussion, especially that portion of the sub-committee's report which recommended that the stores department assist in the inspection and testing of minor materials. It was held that although the function of major tests rested with the engineering departments of the individual companies, the stores department could be of assistance. After deciding not to specify what materials the stores department should test and with a slight alteration in the text the report was allowed to stand.

The following members were present: J. Fleming, chairman; John Y. Bayliss, A. S. Duncan, A. L. Fischer, B. W. Forkner, A. E. Hatton, F. A. Jordan, T. H. McGarry, A. A. Ordway, W. E. Scott, and W. J. Walker.

Overhead Current Collecting Devices

SPECIAL rolling stock committee No. 11, overhead current collecting devices, held a meeting at the Engineers' Club in Philadelphia, Pa., on May 3, 1927. There were present at this meeting H. Savage, chairman; H. S. Murphy, W. C. Klein and D. L. Smith.

The committee has sent out a questionnaire to the member companies to obtain information on the collection devices used by them at the time of the meeting. A number of replies to this questionnaire had been received. These replies were read and discussed in detail. It was finally decided to arrange the information obtained in a condensed form for presentation to the standing committee on rolling stock at its meeting to be held on June 7 and 8 at the association headquarters in New York City.

The News of the Industry

Figures of Oakland Value

Present Reproduction Cost Put at $40,626,426 by Company's Engineer—Fare Hearing June 21

An adjourned hearing on the application of the Key System Transit Company, Oakland, Cal., for permanent higher rates was held before members of the California Railroad Commission in Oakland on May 10. After valuation figures had been presented, further adjournment was granted until June 21. At that time reports of the engineers of the Railroad Commission will be filed and further testimony taken.

Richard Sachse, consulting engineer for the company, presented figures showing that the present reproduction cost of the Key System is $40,626,426; $29,163,200 on a reproduction cost less depreciation, and $29,987,074 on the historical reproduction cost system. Mr. Sachse said:

> It may fairly be said that with the completion of this detailed inventory the question of the fair value of the property has been answered. The problem will no longer be as to what the Key System is worth and what constitutes a reasonable return on such an unknown quantity, but rather on how the public service that the company is rendering with an unquestioned investment of more than $30,000,000 can be made self-sustaining. This problem becomes still more important when it is remembered that a street railway business, even more than other going concerns, cannot stand still, but that continual large capital expenditures must be made.

The survey completed by Mr. Sachse cost $100,000. It describes every piece of property owned by the Key System as it existed on Dec. 31, 1926. The work was so carried out that it will be possible from now on for the company to keep its inventory up to date.

C. C. Vargas, comptroller of the company, showed that the net return for last year was $1,200,000 and that it will not be more than half of that this year, making it necessary for the company to pass the dividend and enabling it to pay only interest on bonds.

There was no discussion at the May 10 hearing on the question of fare readjustment. This will come up at a later date. The East Bay cities oppose higher rates and have gone on record against the present 7-cent railway and 21-cent ferry fares.

The spring elections have just been held and new city officials chosen in Oakland and Berkeley and it is probable that the new officials will ask for further adjournment on the ground that they want more time to study the case.

Officials of the Key have intimated to civic leaders that they may offer a compromise on the fare question. One plan being considered is the mileage system of assessing fares.

No definite proposition has as yet been officially made, but it is understood that something of the kind is being considered. The company says that it is losing money on the operation of its bus lines and on its "long riders."

At the present time it is possible for passengers to ride from San Leandro to Berkeley and Albany for a 7-cent fare. This may be changed, so as to put the city into zones, with a graduated scale of fares.

Contracts Let for Westchester Extension

The New York, Westchester & Boston Railway will undertake at once to extend the double-track, all-electric lines of its eastern division to Rye, N. Y. Contracts for the job have been let to the engineering firm of Dwight P. Robinson & Company, and the work is expected to be completed within a year.

During the past three years the railroad has instituted all night service and special commuter express trains on all its lines in Westchester. It has authorized the extension of tracks and passenger accommodations at its Harlem terminal, and through its subsidiary, the County Transportation Company, it has inaugurated in Westchester a system of motor coach lines to serve newly developed suburban communities, L. S. Miller, the president, has pointed out.

Enabling Legislation Introduced

Chicago Surface and Elevated Lines Finally Agree on Unification Plans—Bills Presented to Legislature Call for Transfers, Subways, Home Rule, Indeterminate Permits and Provision for City Acquisition

IN THE brief period of an hour last Tuesday morning, May 17, Chicago appears to have moved closer to a complete and harmonious settlement of its troublesome traction question than in all the recent months of unavailing talk and fruitless negotiations. For no sooner had word been received from Springfield that five traction bills had been introduced seeking the necessary legislation to make effective the various franchise fundamentals recently discussed by city and traction officials than announcement was made in Chicago that a plan for a merger had been agreed to by representatives of both the surface lines and the elevated lines.

The traction bills presented by Senator Barr in behalf of the two transportation companies differ in some respects from those recently framed by Corporation Counsel Samuel Ettelson at the instance of Mayor Thompson, but they embody principles fully agreed to by the Mayor during conferences in recent weeks with traction executives and bankers. The bills themselves merely represent the efforts of the companies to make their consolidation plan legal. Since Mayor Thompson's return to office, all of the differences between the companies which have heretofore slowed up progress appear to have been settled.

If the legislators should pass—prior to their adjournment next month—the necessary legislation provided for in the five bills and the companies are consolidated, there will then remain the negotiation of a franchise ordinance between the city and the companies, and finally a public referendum on the ordinance some time in the fall. Both Mayor Thompson and Governor Len Small have indicated that they will not support traction legislation unless a referendum is provided for. Adoption of the program as it now stands would mean that Chicago would have unified local transportation service with universal transfers between street cars, elevated trains, buses and subways, the latter to be built by the city by means of special assessments and use of the present $50,000,000 traction fund. The City Council would dictate the terms of the ordinance, but would relinquish control of service to a county transit commission.

Except for the modified home rule provision, the traction bills, as formulated by the companies, reflect the same stand taken by traction representatives and bankers throughout negotiations with the city during the past six months. In seeking legislative enactment of the terminable permit plan in place of the twenty-year franchise now allowed by state law, however, the companies acquiesced to the creation of a local Cook County transit commission of five members, two to be appointed by the Governor of the state, two by the Mayor of Chicago and one by the county board.

The transit commission, which would be made a part of the state department of trade and commerce, would control all public utilities in Cook County, of which Chicago is the hub, just as the Illinois Commerce Commission now controls all utilities of the state. The plan is a variation of the metropolitan transportation district proposal offered by Mayor Thompson during his last administration, a plan that failed of adoption by the Legislature by two votes. Members of the new commission would be residents of Cook County and would serve four years, each to receive a salary from the state of $12,000 a year, with a secretary at a salary of $7,000.

The legislative program provides for

the major details of local transportation and rapid transit development in Chicago and suburbs as follows:

> Unified operation of all local transportation facilities—surface lines, elevated lines and omnibuses.
>
> Transfers between surface lines and rapid transit lines at convenient connecting points.
>
> Subways to relieve downtown congestion and facilitate rapid transit.
>
> Immediate development of rapid transit service to localities now suffering for lack of it.
>
> "Home rule" control, regulation and supervision of local transportation by a Cook County transit commission.
>
> "Indeterminate permits" instead of twenty-year grants, in the case of all future street railroad grants by the City Council.
>
> Retention of the city's right to prescribe the terms and conditions of any grant, including provision for acquisition of the local transportation system.

The legislation required for giving effect to this comprehensive program is covered in five bills which provide:

Subways

Bill No. 1 authorizes the city of Chicago to build subways, to be financed wholly or in part by general bonds, special assessment, of use of the city's traction fund, and to lease the same on such terms and for such length of time as the City Council may deem wise. The expense of removing or relocating existing underground utility facilities which may be in the way of a subway is assumed in the first instance by the city but with the right to provide for its reimbursement from lessees of the subway: this, to avoid long drawn out disputes and possible litigation with other utilities.

Indeterminate Permits—Municipal Ownership

Bill No. 2 amends the cities and villages act of 1872 by dropping the twenty-year limit on future street railroad grants and by providing that frontage consents will not be required for putting tracks in subways.

Bill No. 3 applies the terminable, or indeterminate, permit principle so generally approved in current discussion. It provides that future grants of authority to construct and operate, or maintain and operate, a street railroad shall continue in force until the property is purchased by the city or until terminated for nonuser or misuser, according to law.

This leaves to the city the right to prescribe, in any grant, such terms and conditions as it may see fit, except that the grant may not be for a fixed term of years and that the terms and conditions may not be inconsistent with the laws relating to public utilities.

The indeterminate permit provision is necessary to meet the financial requirements for carrying out the program for unification and development of local transportation in Chicago. It does not affect existing unexpired franchises, but applies only to future grants.

For Unified Local Transportation

Bill No. 4 permits a single company to acquire and own the street railroads, the elevated lines, the bus lines and other local transportation facilities. It is expressly provided that nothing in the Act shall be construed to authorize street railroad construction or operation without the consent of the local authorities in city, village or incorporated town.

Home Rule Regulation

Bill No. 5 provided for a Cook County transit commission of five members, having jurisdiction over the proposed unified company and all of its lines.

Local responsibility—"home rule"—is assured by providing: (1) That all five members of the commission shall be residents of the county and (2) that two of them shall be named by the Mayor of Chicago and one by the county board. The other two are to be named by the Governor.

In this connection it is explained that in Cook County ten of the fifteen members of the county board are voted for and elected only by citizens of Chicago. Therefore, three members of the Cook County transit commission—two named by the Mayor of Chicago and one by the county board—will always be directly responsible to the people of Chicago. All expenses of the county commission will be borne by the state and these expenses will be subject to approval by the Governor.

The county commission also meets the necessity of recognizing the physical facts of Cook County. There are now in the county, outside of Chicago, more than 85 cities and villages. Many of them are large sized communities, already served by the elevated lines. The future growth of this great metropolitan district will disregard corporate limits and will undoubtedly require extensions of lines throughout the district outside of the city of Chicago.

The point is made that a law giving to the Chicago City Council the power of regulation over a company serving many other cities and villages outside of Chicago would be of doubtful legality to say the least. Nor would it be practicable to have the company's lines regulated in part by the city and in part by the Illinois Commerce Commission. The bill is regarded as the nearest approach to home rule that is both legal and practicable.

A statement signed by Henry A. Blair, president of the Chicago Railways, Britton I. Budd, president of the Chicago Rapid Transit Company, and Leonard A. Busby, president of the City Railway, says:

> The bills have been drawn to meet the necessities of the peculiarly complex and "special" traction situation in Chicago, without contravening the state's constitutional prohibition of special or class legislation. They contain no "jokers." They meet the peculiar complexities of the Chicago situation without disturbing existing conditions in other parts of the state; and they are, at the same time, practicable for application in other parts of the state if circumstances comparable to those of Chicago ever arise there.

As yet Mayor Thompson has offered no definite legislative program, but insists that any solution must assure good service, just wages, decent working conditions and a fair rate of return on actual investment. The Mayor's attitude toward home rule closely approximates the plan put forward in the companies' legislative bills. A public hearing on the three traction bills prepared some time ago by the Corporation Counsel's office at the direction of the Mayor, will be held by the joint senate and house committee in Springfield about May 25. The bills provide for consolidation of elevated, surface and bus lines and for the terminable permit plan as a substitute for the present twenty-year franchise.

Poughkeepsie Recognizes "No Accident" Employees

A marked falling off in accidents is the result of a three months "no accident" contest carried on the lines of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y. The plan is to be continued for another three months campaign.

Prizes of $5 for each member of the winning crew were awarded on May 3 when the men received their pay envelopes. There were seven men on the losing crew who had clear records during the period covered in the contest and consolation prizes of $2.50 were awarded each man. Captain Rhodes of one of the winning crews entered the employ of the company 37 years ago as a horse car driver. E. Schoonmaker, captain of the other winning crew, has been in the employ of the company for more than twenty years.

George W. Wells, general manager, said that the majority of the accidents reported in the past three months were due to motorists driving away from curbs without giving the proper warning signal to the motorman; that there were few accidents involving pedestrians and bicyclists.

Paving Law in Arkansas Upheld

In a decision rendered on May 16 the United States Supreme Court held that an act of the Arkansas Legislature which in effect compelled the Fort Smith Light & Traction Company to bear the expense of certain street paving in Ft. Smith, Ark., was not an arbitrary or unreasonable exercise of the legislative functions.

Under authority of an act of the Arkansas Legislature of 1919, amended in 1921, the utility surrendered its franchise to operate in Fort Smith for an indeterminate permit to operate subject to regulations of a utilities commission. The franchise provided that it should pay the cost of paving streets between its rails and to the end of the ties, and limited its fare to a maximum of 5 cents.

In 1923 the Legislature enacted a law requiring street railways under certain conditions which were met in this particular case, to pave between their rails to the end of the ties and which empowered improvement districts to do the paving and charge the cost to the railway in the event the companies refused to do the work themselves. The Fort Smith company was asked to pave certain streets under this law and refused, whereupon the work was done by the Board of Improvement of Paving District No. 16 of the city of Fort Smith.

The company resisted an attempt to make it pay and the suit resulted. The company claimed that the law of 1923 was unconstitutional in that it was an impairment of a contract. It also charged that the law was so phrased as to apply only to this particular railway in Arkansas.

The Supreme Court held that the act was not arbitrary or unreasonable. It pointed out that while the law of 1919, under which the company surrendered its franchise and obtained an indeterminate permit, did not provide that the company should defray the cost of paving, at the same time it did not exempt the company from such charges and that it was not unconstitutional for the act of 1923 to be so framed as to apply only to the Fort Smith company in effect.

New York State Wage Conferences End

Wage conferences between James F. Hamilton, president of the New York State Railways, and the Rochester-Syracuse-Utica, employees' agreement committee ended on May 18. The result will be submitted to the employees for a vote on May 25. Officials declined to give out the result of the negotiations. The men sought an increase of 9 cents an hour.

Question of Suburban Fares Raised in Cleveland

By the terms of a franchise which a committee of the City Council of Cleveland, Ohio, has rejected, Cleveland Heights agreed to a rate of fare on the lines of the Cleveland Railway always 1 cent higher than the rate within the city. In return the company contracted to make certain extensions within the suburb. The claim of the Cleveland committee, supported by the street railway commissioner, is that this 1-cent differential is not sufficient to pay the cost of service. It proposes, instead, a differential which in case city riders pay 7 cents, as they do now, Heights riders would pay 10 cents.

The 1-cent differential was recommended by the metropolitan committee. According to the Cleveland *Plain Dealer* it represents what that committee, after a painstaking study, believed was a fair adjustment between city and suburban car riders. How difficult it is to fix transportation costs accurately, however, was acknowledged by the committee, which declared in its report:

> Any attempt to provide service-at-cost for the individual car rider must of necessity produce only an approximate result . . . It is only the imaginary average car rider, the man who rides for an average distance on an average line, who gets his service exactly at cost.

The opinion of the *Plain Dealer* is that if the Cleveland Council attempts to club any suburb into accepting a franchise which the suburb's own judgment thinks unfair—particularly, when the suburb's position in the controversy is indorsed by an authority as good as the metropolitan committee—it will set back the progress of traction peace on which the welfare of the whole community hinges. That paper said:

> Years of increasing difficulties for Cleveland's traction system led to the creation in 1925 of the metropolitan transportation committee and its recommendation of a program of co-operation between the city and the suburbs. That program, widely commended at the time, is imperiled by the attitude of a council committee. If it is destroyed, we will see re-established the same chaotic conditions that alarmed the community previous to 1925 and brought the metropolitan body into existence.

Increase in Fares Asked in Sacramento

The Pacific Gas & Electric Company has applied to the California Railroad Commission for authority to increase fares on its electric railway system in the city of Sacramento, alleging that the present rates and fares are inadequate to produce a fair return upon the investment in the properties. The company asks permission to establish the following passenger rates:

One-way fares on all lines, 7 cents; weekly pass, good over entire system transferable with unlimited use to the holder during the calendar week issued, $1.50; school tickets, to be limited to children under thirteen years of age, and to be accepted only on regular school-days between the hours of 8 a.m. and 4:30 p.m.; special car rate, minimum charge, $5.

Newspaper tariff, 10 lb. per 100 papers, 6,000 papers, $4.50; 11 to 45 lb. per 100 papers, 6,000 papers, $7.50; 46 to 75 lb. per 100 papers, 6,000 papers, $10.50; all over 75 lb. per 100 papers, 6,000 papers, $13.50. Bundles weighing in excess of 40 lb., and not to exceed 150 lb. to be handled only when in charge of messenger paying regular fare.

The company alleges in its application that its railway system has an average historical cost of the depreciable property during the calendar year 1927, in excess of $2,460,000, and that the reproduction cost, as of Jan. 1, 1927, exceeded $3,825,000. Operating revenues during 1926 did not exceed $713,941, it is stated, while the operating expenses were $602,505. The depreciation fund set aside during 1926 to cover actual deterioration and probable losses was not less than $81,227, leaving a net income of $30,209, or a net return of 1.19 per cent of the historical cost of the 44-mile property.

Tornado Damage in St. Louis

A car washing shed of the United Railways at Spring Avenue and North Market Street, St. Louis, Mo., was unroofed in a near-tornado that swept that city on May 9.

The long arched roof, blown off in one piece, was carried north into St. Ferdinand Avenue, blocking that street. A part of the heavy framework crashed down upon a group of nine steel cars.

Street car service suffered at various points in North St. Louis because of the storm. Company officials report there were 100 interruptions of more or less consequence. These interfered with owl service, but at daybreak cars were running regularly on all but the Manchester and Broadway lines.

The Manchester cars were rerouted via the Market and the city limits lines, while shuttle service was maintained on the west end of Manchester Avenue to Maplewood.

North Broadway was blocked until 10 a.m. in the vicinity of O'Fallon Park and Broadway cars were detoured at Franklin Avenue via the Bellefontaine line to West Florissant Avenue and thence via the Taylor line to Broadway. Shuttle service was maintained on Broadway from Franklin Avenue to Salisbury Street.

Fallen trees, poles and wires were responsible for many troubles. The wind reached a velocity of 72 m.p.h., and its force was so great that iron trolley poles along the Grand Avenue viaduct spanning Mill Creek Valley were bent as if twisted by a giant hand. Many wood poles were snapped in two.

Charles L. Henry Memorial by C.E.R.A.

"Whenever the history of electric railways in Indiana and their extensions in the other parts of the United States is written there will be coupled with their growth and development the name of Charles L. Henry, whose memory will be ever cherished and enshrined in the hearts of a grateful people." This is the concluding sentiment in a memorial and resolution adopted at a meeting of the executive committee of the Central Electric Railway Association at Fort Wayne, Ind., on May 4, 1927. It was resolved that a copy of this memorial be sent to the bereaved family of Mr. Henry and inscribed upon the records of the Central association.

"L" Removal Plan in Brooklyn Deferred

Although Borough President Byrne of Brooklyn was moving to speed action on the removal of the "L" from downtown Fulton Street the problem was relegated to the distant future on May 9 at an organization meeting. Recently the appointment of Matthew S. Sloan, head of the Brooklyn Edison Company, as chairman of a committee of 100 was announced. Forty-two civic organizations, including the Civic Council, composed of the representatives of nearly 100 groups, and the Chamber of Commerce have adopted resolutions demanding the removal of the "L" from the business section downtown. A bill was passed and signed by the Governor giving the city the right to condemn the structure.

In connection with the matter of the consideration of the Fulton Street project the Committee of One Hundred has adopted another resolution. This calls for a petition to be presented to the Board of Estimate urging that body to act favorably upon the plans for the proposed Fulton Street Subway. The resolution also favors the elimination of other remaining elevated roads in Brooklyn after the removal of the Fulton Street structure.

Britton I. Budd Medals Awarded for Saving Lives

The medal for the saving of human life, recently established by Britton I. Budd, within the electric light and power and electric railway companies of which he is president, as an award of honor for any employee who saves the life of any one, anywhere and at any time, was presented recently to two employees of the Public Service Company of Northern Illinois, one employee of the Chicago Rapid Transit Company and posthumously to a late employee of the Chicago, North Shore & Milwaukee Railroad. Those receiving the medals on the electric railway properties and their citations were:

Lyman Dean, deceased, motor coach operator for the Chicago, North Shore & Milwaukee Railroad. On Oct. 25, 1926, Dean was driving eighteen school children, when his coach was caught in the path of a Chicago, Milwaukee & St. Paul Railroad train at Northbrook crossing, near Chicago. Dean remained at his wheel and succeeded in backing the coach far enough off the tracks so that only the front end, where he himself sat, was struck. None of the children was killed. Dean is survived by his wife and three children. Mrs. Dean received the medal from Mr. Budd.

Melville Cover, 21 years old, inspector in the communication department of the Chicago Rapid Transit Company, on Sept. 13, 1926, saved the life of Ralph Grieg, eight years old. The child was brushed from a trestle of the Chicago, Aurora & Elgin Railroad into the Des Plaines River. Cover, who was a passenger aboard the train, saw the lad strike the water and he dived from the train into the river 25 ft. below. He removed the boy to a sandbar and then proceeded to the work of reviving him.

Centralized Train Control on North Shore Line

A new plan of organization of the transportation department of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., was put into effect recently by John F. Egolf, general manager of the railroad. Under this plan the superintendent of transportation is responsible for all activities of the department. The number of men reporting directly to him has been decreased from seventeen to nine, and he is relieved of detailed supervision of one of the divisions. Both these improvements free him for the more important work of directing the operations of the department.

One of the most important changes in organization was the discarding of the three-division arrangement in favor of one division and the placing of control of all train operation on all lines (except in terminals) under a new official, i.e., the division superintendent of main lines. Train operation in terminals and all terminal activities are placed under the control of the division superintendent, Milwaukee terminal; division superintendent, Waukegan terminal, and division superintendent, Chicago terminal, respectively.

Train dispatching is all done from one central point, North Chicago Junction, whereas formerly it was done from two remote points, Milwaukee, Wis., and Highwood, Ill. Train dispatchers are responsible for dispatching and recording the movement of trains, but they are relieved of recording the reporting of trainmen. This reporting is now taken care of by employees at the respective terminals and at Highwood. The chief dispatcher is responsible for train dispatching and for assignment of runs to trainmen.

With this and other details of organization in effect, the operation of trains is unified and authorities and responsibilities are direct and clearly defined. Likewise, the plan is economical, for although additional supervision was provided both at the Chicago and Milwaukee terminals, there are fewer employees under the new plan than under the old.

State Supreme in Revoking Franchises

Under a decision handed down by Supreme Court Justice Crosby at Buffalo, the state of New York is the only legal power that can revoke franchises of the International Railway, Buffalo, N. Y. The decision followed the application of the company for an injunction restraining the municipal authorities from revoking six franchises of the International in various streets of the city for alleged non-compliance with orders of the Public Service Commission. The court, however, entered no final order in the matter and suggested that Frederic C. Rupp, municipal corporation counsel, and Henry W. Killeen, of counsel for the railway, try to agree. If they cannot agree, then the court will enter a final order.

Justice Crosby says the original franchises were granted by the state of New York with the city consenting and says the rights can only be revoked by the state, which granted them. The court held, however, that the city should be permitted to pass any and all resolutions, serve any and all notices and papers and do all things that may be necessary or expedient as preliminary steps to the bringing of a proper action to accomplish the revocation of the railway's franchise.

Report at Cincinnati Favorable to Railway

Electric railways furnish the cheapest and most convenient service for moving large masses of people, says the report of the committee on street railways of the Cincinnatus Association of the city of Cincinnati. Among conclusions set forth in the report are:

> 1. A realization that the competition of the automobile has driven the electric railway out of the field of natural monopoly, and therefore it should hereafter be conducted along lines of a private industry, side by side with independent bus lines, so that the enterprise which gives the best service will eventually win out and drive the other entirely out of the field. Our knowledge of the science of urban transportation indicates that electric railways furnish the cheapest and most convenient service for moving large masses of people and it is, therefore, unthinkable at present that this means should vanish from our cities.
>
> 2. Municipal ownership. Whatever the pros and cons of municipal ownership may be, it is agreed that it could not immediately solve the problem. Furthermore, public ownership and public operation in the present state of laws governing municipal action, and especially in the light of present municipal finances, would make its adoption impossible short of a considerable period of years.
>
> 3. Private ownership and operation on a sound, fundamental basis of regulation and control. On this final alternative in the form of the service-at-cost plan recently adopted after five years of negotiation, is based our hopes for the future.

In referring to the report, the Cincinnati *Enquirer* says editorially that public ownership is a delusion and that the question of how best to co-ordinate the bus and the railway service is the problem which must be worked out.

The pamphlet is published with an introduction by the Cincinnati Street Railway. That company says:

> A short time ago a committee was appointed by the Cincinnatus Association and charged with the duty of making a study of the local railway and general transportation situation with special reference to operation under the city control and service-at-cost plan by the Cincinnati Street Railway. The members of the committee were well qualified for making a careful and disinterested study of the subject and devoted an unusual amount of time and attention to the work. The report of the committee was presented to the association by the meeting of its members, but was not given general distribution.
>
> The Cincinnati Street Railway cannot agree with all of the premises in the report or accept all of its conclusions. Notably, we think that street railway industry is by no means immersed in the gloom that Mr. Lowenberg sees. The industry is looking up in all places. Other than this, the points of disagreement are such as might well arise out of an honest difference of opinion, and the report contains so much of value in the way of information, explanation and analysis of the close and mutual relations between the transportation system and the public that in my opinion it should be made available for wider distribution. The permission of the committee having first been secured, the report is now published in the present form.

This statement is signed by Walter A. Draper, president of the Cincinnati Street Railway. The report of the committee was rendered in the name of Laurent Lowenberg, chairman, and Leonard Smith, Jr.

Sanitary Regulations Fixed by Legislation in Ontario

Passengers on street cars in Ontario are to have roomier and more sanitary rides hereafter. That is the way the newspapers are broadcasting the account of legislation recently enacted. The regulations limit the number of passengers to one and two-fifths of the proper seating capacity, but permit an additional five passengers on rear platforms. They require also a thorough cleaning of the car interiors daily, adequate ventilation, thermometers in each car, celluloid covered straps and cushions that are readily cleaned. Eustace Smith, secretary of the Canadian Electric Railway Association, is reported to have characterized these regulations as too stringent and to have said that "a literal interpretation of them would ruin some companies."

Chicago Students Must Pay for Car Damage

Acts of vandalism committed on cars of the Chicago Rapid Transit Company, Chicago, Ill., were publicly condemned by officials of the Chicago public schools in a recent decision requiring students of the Englewood High School to make full restitution for damage done to the cars of a train on the elevated lines. The occasion was on March 24 when homecoming students riotously celebrated their team's winning of the city basketball championship. Two hundred students boarded the train at a north side station, smashed windows and electric lights and ripped advertising posters from the walls of the cars.

Rochester Subway to Be in Operation by August

That the New York State Railways will operate the municipally built subway and freight line in the bed of the abandoned Erie Canal in Rochester, N. Y., was assured by final action of the Common Council on May 10. The line will be operated for a three-year trial period under general terms of the service-at-cost contract between the railway and the municipality.

The question of who was to operate the subway has agitated Rochester for the past two years. More than a year ago the late Mayor Clarence D. Van Zandt appointed a committee to draft recommendations on the operation of the line after a survey. Some three months ago the committee reported in favor of operation by the railways only after a majority sentiment in favor of the report had been ascertained through public hearings and a poll of industries. Agreement to the proposal had been obtained from the four steam railroads entering the city.

An important function of the city railroad will be its use for freight switching connecting the railroad lines with important industries throughout the city. The subway line will provide high-speed transportation for outlying sections and will direct interurban traffic from the streets, thus helping to solve an important traffic problem. Supervision of the new line will be under City Railway Commissioner Barnes.

Excess Paving Costs to Be Paid by Denver Tramway

The Denver Tramway, Denver, Col., and the city of Denver have been at cross purposes for more than a year relative to the tramway paying a certain amount for street paving. The company flatly refused to pay. The outcome of this and some other matters pertaining to the company and the city is docketed in the federal court. However, on May 5 the tramway informed the city that it would pay the excess cost of paving streets on which it operates cars, it costing more to pave streets on which there are car tracks than those on which there are no tracks.

Committee Named to Negotiate Los Angeles Purchase

Following the suggestion of Dr. Delos F. Wilcox, acting in an advisory capacity for the city of Los Angeles, Cal., in the matter of the proposed increase in fares requested by the Los Angeles Railway, the City Council on May 14 named a special committee to negotiate with Henry E. Huntington, the owner of the railway system, or his representative, as to the best price and the most favorable conditions for the acquisition without the necessity of issuing bonds against the general credit of the city. This committee was authorized to ascertain terms upon which the city can procure a standing option to buy the railway lines.

The action of the City Council was not unanimous, there being considerable opposition to the proposition. It was contended that the ownership of the lines of the Los Angeles Railway by the city would mean an actual increase in fares from the present rate of 5 cents to 6 cents or possibly 7 cents. This contention was over-ruled and the committee named.

Engineer Ridgway Talks on Transit in Seattle

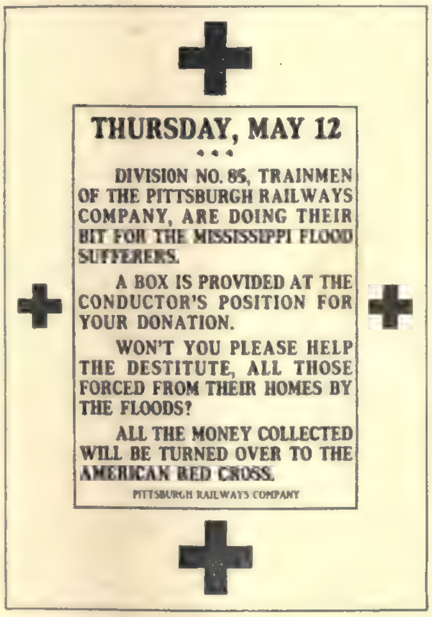
The City Council on May 9 unanimously adopted the principle of rapid transit for Seattle, Wash., and requested the rapid transit committee to make further investigation and submit a plan of financing. Robert Ridgway, New York, at the committee's request, arrived in Seattle from San Francisco and spent May 12 going over the ground. That evening a banquet was tendered in his honor by the rapid transit committee. It was attended by the entire City Council, board of public works, comptroller, attorney and treasurer, planning commission and representatives of banks, railroads, port commission, schools, parks and newspapers and by merchants and others, also delegates from about 30 civic organizations. It was impossible for Mr. Ridgway to remain longer. He could not, of course, make a report upon such short investigation, but in response to questions at the banquet stated he saw no faults with the committee's plans. The principal object in inducing him to visit Seattle was to confer upon the city's procedure and consult with him generally.

Joe Schenck nears the top in Pittsburgh drive

The Unusual Again in Pittsburgh

Through the opportune presence of the famous motorman-conductor vaudeville team of Van and Schenck, the Pittsburgh Railways was able to enhance its wholehearted Red Cross work on behalf of the Mississippi flood sufferers. On Thursday, May 12, a platform was set up on the street alongside the building of the Philadelphia Company, which controls the Pittsburgh Railways. The 40-piece Railway Employees' band volunteered to play and the Philadelphia Company's quartet to sing between the various vaudeville acts put on by Van and Schenck and other generous artists.

A hook and ladder company, through the courtesy of Richard Smith, fire chief, set up a mighty ladder which Joe Schenck offered to climb rung by rung for every dollar collected by the 25 uniformed railway inspectors. With Gus Van acting as chief barker for his partner, the dollars came in until Joe found himself on the top rung at the sixth story, as a $250 collection indicates.



THURSDAY, MAY 12

DIVISION NO. 85, TRAINMEN OF THE PITTSBURGH RAILWAYS COMPANY, ARE DOING THEIR BIT FOR THE MISSISSIPPI FLOOD SUFFERERS.

A BOX IS PROVIDED AT THE CONDUCTOR'S POSITION FOR YOUR DONATION.

WON'T YOU PLEASE HELP THE DESTITUTE, ALL THOSE FORCED FROM THEIR HOMES BY THE FLOODS?

ALL THE MONEY COLLECTED WILL BE TURNED OVER TO THE AMERICAN RED CROSS.

PITTSBURGH RAILWAYS COMPANY

The appeal of the placard was irresistible

The biggest help from a dollar and cents standpoint came through the action of Division 85, Amalgamated Association, whose trainmen offered to serve as collectors on the cars. To this end, 1,700 Red Cross collection boxes were placed alongside the fareboxes in the cars and a placard displayed in the windows. The Pittsburgh Motor Coach men did likewise. In this way a total of $2,753 was collected, including the returns from street entertainment. So eager were some of the passengers to contribute that they presented car tokens when cash was lacking.

The collection made was not only substantial in itself, but was a splendid advertisement for the cause at large.

Six Cents on All Lines Sought in Los Angeles

Application for an immediate emergency 6-cent fare on all lines operated by the Los Angeles Railway Corporation was filed on May 17 with the California Railroad Commission. A hearing permanently to increase the rate of all yellow lines is now before the commission. The 6-cent rate, according to a statement issued by George J. Kuhrts, vice-president and general manager, is necessary to maintain the present railway system pending the outcome of the present hearing relative to the 7-cent rate hearing.

Mr. Kuhrts says the railway has urged the greatest expedition in the hearing because of its unfavorable financial condition. He said that the company's earnings had further declined and the financial statement for 1926 showed that the company did not earn the interest on its bonds and borrowed money. The estimate for the year 1927 showed that the company would earn even less and fall short of earning its interest charges by about $1,000,000. He added that the railway would be unable to proceed with its plans for the purchase of additional equipment and the carrying out of improvements unless the immediate relief, available through the emergency 6-cent fare, was granted.

More Suburban Electrification Work at Philadelphia

The Pennsylvania Railroad has started the physical work of electrifying its Octoraro branch, extending from Philadelphia through Lansdowne, Morton, Media and Swarthmore to Wawa and West Chester. The first concrete foundations for poles to support overhead wires on the Octoraro branch are now being laid. The work will proceed out the branch to West Chester, a distance of 27 miles.

Steady progress is being made on the electrification work between Philadelphia and Wilmington. All the new larger and higher signal bridges made necessary by the pantographs on top of the electric cars have been installed.

Longer Platforms Speed Chicago Service

Extension of station platforms on all lines of the Chicago Rapid Transit Company, Chicago, Ill., to accommodate eight-car trains has recently been completed. The work started in July, 1925. It cost $701,929. The longer trains and faster operation made possible by this improvement have resulted in a noticeable lessening in congestion and in increased convenience and comfort for riders. At stations on the elevated loop in downtown Chicago as many as three trains may now load and unload passengers simultaneously.

The removal of "L" columns supporting the structure from the center of the street to the curb along Wabash Avenue at intersections has also been completed. This work was undertaken by the company to help relieve traffic congestion in downtown streets. It is part of a three-year program of relocating structure columns in the "Loop" district to be concluded in 1928.

Another Problem in Saturation

The automobile has been its own enemy in urban transportation. For a brief period it robbed public utility carriers of their passengers, but as its use for transportation to the office and shopping zones increased, the traffic problem was created, until today the public is beginning to realize that the individually-owned and operated automobile during business hours is a liability rather than an asset. New York City, because of its geographical restrictions, knows what the saturation point for the automobile will be like, and in that city street car and bus riding has increased. In Detroit, however, a directly opposite condition obtains.

Street railway and bus operators have begun to sense the change. An Eastern city is witnessing an experiment with pneumatic-tired street cars. Even in Washington the sight of luxuriously upholstered buses and street cars, in which one may recline with all the comfort of the fireside chair, is not unusual. Street railway advertising has begun to stress the parking problem as compared with the comfort and convenience of street cars. Mass transportation is bound to be the development of the future, for no other adequate use can be made of every square inch of street surface.—*Washington Post.*

"Zero Hour" Strikes Again in Atlanta

The second "zero hour" drive of the Georgia Power Company in Atlanta is being held from May 10 to May 26 and the Atlanta Safety Council, under the slogan "Help Prevent Accidents," is co-operating in every way to make the campaign more successful. The "zero hour" idea, originated with W. J. Rountree, safety director of the company. It proved so successful in reducing accidents on its first trial some weeks ago that the second drive has been planned, which will have the co-operation of the school department, press and other agencies. On May 10 "zero hour" was fixed from 7 until 8 o'clock in the morning. Since then the "zero hour" has been moved up one hour each day, closing with an hour between 11 and 12 midnight on May 26. During this hour trainmen throughout the city will be particularly careful in their efforts to avoid accidents.

Identification Number Conspicuously Displayed in Detroit

In maintaining a friendly spirit of public relationship, the city of Detroit, Department of Street Railways, believes that the matter of providing a more conspicuous means of identification of its public representatives is an important factor. In furtherance of this plan new badge numbers have been mounted on trainmen's caps, and can be easily distinguished at a distance of 30 ft. or more. The initials and numbers are white enamel and stand out very prominently against the black enamel background. Discernibility is made even more pronounced by the black silk cap on which the badges are worn. On the old type badge the number was so small that it could not be deciphered without close inspection. This was somewhat embarrassing to a patron who might have occasion to report the employee for some offense or possibly commend him for his efficient and courteous conduct. Delivery is now being made on an order for 6,500 of these badges.

Kewanee System Described

The products and activities of the city of Kewanee, Ill., are made the subject of comment in the May issue of *Current Topics*, the official publication of the Illinois Power & Light Corporation. Emphasis is laid on the utility services rendered in the fields of the electric light and power, gas and city railway. All these services are supplied by the Kewanee Public Service Company, which in addition operates the Kewanee & Galva Railway, an interurban line between the two cities.

The Kewanee Public Service Company became affiliated with the North American Light & Power group on Sept. 10, 1926.

Buffalo Men and Management Aid Community Fund

William E. Murphy, president of the International Railway Co-operative Association, announced on May 10 that at a convention of all employee representatives under the Mitten co-operative plan it had been decided that each employee would contribute from his pay to the joint charities drives of the Niagara Frontier. Later, at a meeting of the general committee, representing both employees and employers, it was agreed that the total amount would be matched by the company. The sum so obtained will be distributed in accordance with the budgets of the various drives. Under the new law, the first contribution of $2,500 to the Community Fund was made on May 10. During the campaign every street car in the city carried in space donated by I.R.C. a dash sign reminding citizens of the drive.

News Notes

Drops Five-Cent Fare.—Abolition of the last general 5-cent railway fare in Massachusetts was approved on May 13 by the State Department of Public Utilities. It granted the request of the Union Street Railway, New Bedford, for an increase to 10 cents or four rides for 25 cents. The commission stipulates half fare for school children.

Tramway Rewards Firemen. — The Denver Tramway, Denver Col., sent a check for $100 to the Denver Firemen's Pension Fund. This was in appreciation of the good work done by the firemen when the company's sand elevator caught fire on March 30.

Service to Island Taken Over.—The Toronto Transportation Commission, Toronto, Canada, took over the ferries running to the Island (summer resort and park owned by the city) on March 1. The private agreement had expired, so the city bought both passenger and freight boats, about ten in all. The fare charged is the ordinary railway rate of 7 cents.

Wheeling Citizens to Decide on Paving.—At the general election to be held in Wheeling on May 26 the people will decide whether or not the Wheeling Council should be permitted to contract with electric railways as to their paving obligations. The bill covering changes in the Wheeling charter passed the West Virginia Legislature, but a provision was inserted calling for a referendum vote of the people on such authority. If the referendum carries it means that the Wheeling Traction Company will be permitted to enter into a contract with the city whereby it will place and maintain the concrete base under the tracks while the city will care for surface paving.

Railway Will Pay Toward Bridge Improvement.—The United Railways & Electric Company, Baltimore, Md., again has demonstrated its desire to help bring about improvements in the city. The company has notified the chief engineer of Baltimore, Bernard L. Crozier, that it will pay $10,000 toward a proposed bridge to carry Clifton Avenue over Windsor Mill Road. The new bridge will be of concrete and will be constructed by the city. It will cost about $150,000. The structure will replace a wooden one over which the street cars operate. The United is not required by law or the terms of its franchise to pay any part of the cost.

The Young Visitors.—"Boys' Day in Industry" was heralded in the general offices of the Los Angeles Railway, Los Angeles, Cal., recently when nineteen high school boys representing thirteen high schools visited the plant in an educational tour. A special bus loaned through the courtesy of the bus department conveyed the boys to the South Park shops, where they were introduced to Master Mechanic Stephens, General Foreman of Carhouses William Brown and General Shop Foreman Walter Brown. No part of the plant was overlooked in the quest for knowledge. Now the company is offering the youths who were on this trip $5 for the best essay and $2.50 for the second best essay on their tour of the company's properties. *Two Bells*, the official publication of the company, recommends "hold 'er down to 300 words."

C., H. & D. "News" in Circulation.—At no fixed date, but at intervals more or less irregular, the Cincinnati, Hamilton & Dayton Railway, with operating offices in Hamilton, Ohio, will issue the Cincinnati, Dayton & Hamilton *News* whenever the company has anything worth while to say. This sheet has wide circulation, being distributed not only on all the cars, both city and interurban, but goes forward to members of various trade organizations and clubs in Dayton and Cincinnati, including the women's organizations. Advertisements are run in all of the local papers, briefly summarizing the high spots in the *News* issue and a news story is furnished to the newspapers.

Contention Over Paving Expense.—A paving dispute has arisen in Albuquerque, N. M., over the City Electric Company's refusal to pay for the paving between car tracks and 1 ft. on each side. The city put in the paving and then sued the company for the costs, plus 12 per cent from April 19, 1924, amounting to $32,749. On May 6 the State Supreme Court sustained the city and declared that it had a lien for the amount on the company's property; that unless the company paid, the property would be seized and sold and the city permitted to bid, but not in excess of the amount the company owed.

Wages Remain Same in New Orleans.—The present contract between the New Orleans Public Service, Inc., New Orleans, La., and the union of trainmen will be allowed to stand for at least another year. The contract was signed Aug. 12, 1926, after prolonged negotiations. It is for three years, but either side has the privilege of reopening the question of wage scale prior to May 1 of any year during which the agreement is effective. No request for modification has been made and the time for such request this year has passed.

Tokens in Oakland.—Use of tokens in payment for car rides has been instituted by the Key System Transit Company, Oakland, Cal. These tokens are offered for sale to passengers by conductors at the rate of five for 35 cents. They also will be given as change to those who desire them. President Lester S. Ready said that the token system was being introduced in Oakland and the East Bay cities for the convenience of the traveling public; that an investigation had proved that many of those who patronized streetcar and bus systems preferred to handle one token, representing one ride, rather than three coins. "There also will be a great saving of time in loading the cars during rush hours." he claimed, "for the use of a single token will save the congestion that now occurs from making change." Passengers may use either coins or tokens, but he believed that the use of the latter would become general after their convenience had been established.

Recent Bus Developments

Coach Sale Disapproved

Commission Rejects Proposal of Indianapolis Street Railway to Purchase Bus Company

The Indiana Public Service Commission on May 13 disapproved the proposed purchase of the Peoples Motor Coach Company, Indianapolis, by the Indianapolis Street Railway for $500,000. The commission held that the price was unreasonable and that the financial condition of the railway is not sufficiently sound to make the purchase. The commission said:

> The oral testimony offered and the exhibits do not agree in all respects, but these disagreements need not be entered into for the purpose of this cause, because a reconciliation of such differences would not affect the determination of this cause. The commission believes that the cause depends more upon matters of principle and public policy than on figures.

The order sets out that the physical property valuations brought out in the hearing include $237,318, estimated by Earl Carter, engineer for the commission; $250,000 estimated by A. Smith Bowman, president of the coach company as intangible assets, and $234,000 for the present value of the 40 buses of the company, and $233,622, physical value fixed by Harry Alexander, acting for Mack Trucks. In this connection the commission said:

> The above appraisals are typical of the evidence introduced. The difference between the present value of the tangible assets and the $500,000 to be paid for the common stock, plus the obligations of not less than $92,000 to be assumed by the petitioner, represents the value of the business or going concern value and working capital. That sum would be $241,000 on the basis of $500,000 purchase price and $333,000, the highest estimate of tangible assets on the basis of $592,000 purchase price including liabilities assumed. Even the lesser of these sums is not within reason as indicating going concern value and working capital.
>
> If the proposed purchase price were reasonable—if it were a prudent investment—the reasonable ability of the purchaser to pay the consideration proposed should be considered before authorizing the purchase.

It also is pointed out that the legal rate of interest in Indiana is 6 per cent and that testimony showed the best bid obtainable on the notes was 8 per cent. The order says that these facts lead the commission to believe that this investment would be hazardous and that since the motor coach company "is now serving the public with fair success, both in service to the public and in yielding financial return to the operator, a transfer of the operation should be based upon ample assurance that it would be run successfully. Such conviction has not been warranted by the evidence in this cause."

The order also says that under the proposed plan of combining the two, there is no provision to give the public any direct financial advantage of the saving, but to transfer the savings to the railway. The commission says further:

> The commission believes that surplus earnings by one public utility should inure to the benefit of the public rather than to be applied to eliminate a deficit suffered by another public utility. Public convenience and necessity is the basis and the reason for the existence of these public utilities. After a fair return from its operations, the additional benefits should flow to the public, whose streets it uses, whose convenience it must serve and whose necessities it must meet. The commission cannot agree to the proposed transfer of the Peoples Motor Coach Company property or to the total denial of the public to participate in savings in the operation of said property in the event of such transfer and in the event of such savings being as estimated or less than estimated.

The order says Mr. Bowman's testimony showed the original investment of his company in 1923 was only $45,000 and that the remainder of the property has been paid for out of the earnings of the company since that time. As the commission sees it, "the public, by its patronage, paid for much the greater part of this property."

John McCardle was the only commissioner who voted against the order.

De Luxe Coach Line from Los Angeles to Sea

Entry by the Pacific Electric Railway, Los Angeles, Cal., into de luxe motor coach service is to begin on a new line to be operated between Pershing Square, Los Angeles, and Castellammare via the highly scenic Beverly Boulevard.

Four parlor coaches will be operated hourly over this route. Each will have a seating capacity of 29 passengers. No more than that number of passengers will be carried. The plans are to make this service of the very highest type, both as to running schedule and equipment used. The date service is to start will not be announced until the buses are received.

In this connection it is interesting to note that a check made recently shows that the company is operating 165 motor coaches. Of these 122 are used in places outside of Los Angeles proper and 43 in local service within the city, this latter figure representing half of the coaches of the Los Angeles Motor Bus Company, owned jointly by the Los Angeles Railway and the Pacific Electric Railway. The combined investment of the company in garages, motor coaches and equipment incidental to their operation exceeds $1,500,000.

Buses Between Indianapolis and Louisville

Through bus service between Indianapolis, Ind., and Louisville, Ky., has been resumed by the Interstate Public Service Company. For the present only two buses are operated each day, but following the completion of the highway work from Indianapolis to Louisville more buses will be added. Bus tickets are good on all of the Interstate interurbans the same as regular interurban tickets, except on extra fare trains.

Three Bus Lines May Replace Railway Service in Lincoln

The Lincoln Traction Company, Lincoln, Neb., has applied to the State Railway Commission for authority to abandon three more railway lines and substitute buses. By an arrangement with the Omaha, Lincoln & Beatrice Railway, an interurban running from the business section to the suburbs of University Place and Bethany, it will withdraw bus service from Lincoln to the former town, and will also cut out a long loop through the residence district of University Place, where it comes into competition with the interurban. The local company says that this bus also competes with its own cars to that suburb, and that the district eliminated is adequately served by the interurban. The buses will stop at 38th and Holdrege Streets, a mile closer the city.

Discontinuance of rail service is also sought on its South Fourteenth line, a distance of 3 miles. This rail service is now supplemented with bus service.

Abandonment of rail service on its North Tenth Street line for a length of 2 miles is also asked. Buses will be substituted. The rails are now down on a street that is to be resurfaced, but the company says it has not the $12,000 required as its share of the improvement. Abandonment also of rail service to Lakeview and Capital Beach, the latter a summer resort, 2 miles west of the city, and substitution of buses is asked.

It is the claim of the company that none of the lines named is paying operating expenses; that it is constantly suffering losses and deficits from its general railway operations in the city, and is not earning a sum sufficient to pay taxes, operating expenses and fixed charges. It shows that it is endeavoring, under great financial handicaps, to continue to render transportation service to the city and that each one of the requests made is in behalf of that program.

Buses on Worcester Suburban Run

Announcement was made on May 17 by officials of the Worcester Consolidated Street Railway, Worcester, Mass., that the electric railway lines in the Blackstone Valley serving towns from Worcester to Uxbridge will be discontinued on May 21 and buses substituted on Sunday, May 22.

Wanted—A Jitney License Ordinance in Louisville

Jitneys are operating on the streets of Louisville, Ky., without paying bus licenses. The bus license ordinance expired on May 1 and no new ordinance has been passed by the General Council to take its place. Passage of a new bus license ordinance was held up by the sinking fund commissioners pending a decision by the Court of Appeals on the injunction suit of the Louisville Railway to enjoin the operation of buses on the streets of Louisville.

Plans of the sinking fund commission is to boost the license of jitneys, based on the number of passengers carried by the machine. The old fee was $25 a year flat. There are approximately 300 jitneys operating on the streets there this year, and based on an average $50 rate, the sinking fund would collect approximately $15,000 in license. This is double the amount now received. Another feature proposed for the new ordinance is to place the jitneys under control of the Board of Public Works.

New York Bus Contracts Blocked Again

Lacking the votes within the Board of Estimate to award a bus franchise to the Equitable Coach Company or to any other of the bidding companies, Mayor Walker of New York City refused to let the matter go to a vote at the May 19 meeting of the board and laid it over for one week.

In the opinion of most observers at City Hall the action means that the board is so hopelessly deadlocked on the bus question that it will be impossible to reach an agreement before the Board of Estimate adjourns for the summer on June 16.

Minneapolis Company Protected from Encroachment

Lake Minnetonka territory has been protected for the Twin City Rapid Transit Company, Minneapolis, Minn., and its bus subsidiary by a decision of the Minnesota Railroad and Warehouse Commission denying the petition by the Northland Transportation Company to pick up passengers at the intermediate stations of Hopkins and St. Louis Park, served by both railway and bus lines of the Rapid Transit Company, for transportation into the Twin Cities over its long-distance routes.

The Northland makes pick-up passengers at Excelsior on Lake Minnetonka, long served by an electric railway for transportation over state highway No. 12, which is outside the center of that town, at 50 cents a head, or 15 cents more than the railway fare to Minneapolis. The commission directed that if greater transportation service to Hopkins and St. Louis Park is required the proper procedure is appeal to the commission.

The commission said that the idea of competition in rendering local transportation in metropolitan areas has long since been discarded in the United States.

Enjoins Buses on Interstate Lines.—Judge Henry T. Lummus, in Superior Court, recently enjoined the Interstate Motor Coach lines from operating any motor vehicles for carrying passengers between Worcester and Whitinsville and intermediate towns of Millbury, Sutton, Grafton and Northbridge, acting on the bill of equity brought by the Worcester Consolidated Street Railway against the Interstate Motor Coach Lines. The bus line is enjoined from operation until it has secured a license from the City Council of Worcester and the selectmen of these several towns. In the bill the Worcester Consolidated declared it has equipment in and for the conduct of passengers in these towns estimated at $2,000,000 and pays taxes on the same to the city of Worcester and these towns.

Bus Service Extended. — The San Diego Electric Railway, San Diego, Cal., has applied to the Railroad Commission for certificates of public convenience and necessity authorizing it to extend its bus service from Fifty-sixth Street in the City of San Diego, along El Cajon Avenue to La Mesa, outside the city of San Diego; and also from the junction of Imperial Avenue and 34th Street in the city of San Diego to the La Mesa district.

Bus Line Sold.—Sale of the Le Roy-Caledonia-Scottsville line of the Rochester Interurban Bus Company, a subsidiary of the New York State Railways, to the Western New York Motor Lines, Inc., has been announced. The Western New York company, with headquarters at Batavia, N. Y., operates the de luxe Blue Bus service between Buffalo and Rochester and several smaller lines in the territory.

Company Wants Exclusive Bus Rights.—The City Council of Seattle, Wash., has been formally notified by the Seattle & Rainier Valley Railway that all negotiations for a transfer fare reduction on the valley line are to be ended unless the company is given exclusive right to operate buses along Empire Way. It had been virtually agreed that the company would reduce from 10 cents to 8⅓ cents fares that include transfer to the municipal lines. In return it was insisted that the company be given a monopoly of transportation in the valley. Walter M. Brown, general manager, informed the Council that Marshall E. Sampsell of Chicago, president, in a telegram has reiterated the demand for exclusive transportation rights. The city is operating a bus line on Empire Way and residents of the district have protested its removal.

Buses in High Point.—A bus system supplanted railway cars in High Point, N. C., during the latter part of April by the Southern Public Utilities Company. Five buses were put on as a trial. When the North Carolina Public Service Company discontinued railway service it conceded its carrying rights to Chester Hawkins of the Southern Public Utilities Company rather than increase the carrying facilities. In the event that the bus system should fail, however, the Public Service Company will re-establish railway service according to a contract with the city officials.

Would Operate Over Chesapeake Bridge.—The United Railways & Electric Company, Baltimore, Md., has applied in the name of the Baltimore Coach Company, under which its bus lines are operated, to be permitted to operate a line of buses between Baltimore and Ocean City, Md., when the Chesapeake Bay is bridged. A bill permitting the bridging of the bay was passed at the last session of the Maryland General Assembly. In filing the application now with the Maryland Public Service Commission, it is pointed out, the United will be in a preferential position when the bridge is constructed.

Financial and Corporate

Inland Empire Purchase Approved

Interstate Commerce Commission Sanctions Deal by Which Great Northern Acquires Interurban System

Interurban lines and all other property of the Spokane & Eastern Railway & Power Company and the Inland Empire Railroad were taken over by the Great Northern Railway on May 10, following receipt of an order from the Interstate Commerce Commission permitting the purchase. The Great Northern has organized a new subsidiary, the Spokane, Cœur d'Alene & Palouse Railways, which will acquire the interests of the two former operating lines in the territory out of Spokane, Wash., headquarters.

The properties have been operated since Dec. 1 by the Great Northern staff under a purchaser's agreement. With the permanent change, F. S. Elliott, general superintendent of the G.N., acquires the new electric properties as a part of his division. Other officials of the new company will be J. M. Doyle, superintendent; B. Lantry, assistant superintendent, and J. W. Hungate, electrical superintendent. A portion of the staff of the old Inland organization was taken into the G.N. offices at Spokane. W. J. Johnston, assistant general manager of the Inland, and operating head, will retain his present offices in the interests of the Harris Savings & Trust Company, Chicago, representing certain bondholders.

The terminal building, depot and headquarters of the Inland system for more than twenty years have been abandoned for this purpose. The electric lines now operate out of the main Great Northern depot. This means the abandonment, also, of the former main electric line through Main Avenue, one of Spokane's busiest streets.

The Interstate Commerce Commission approved the sale of the electric railways on the basis of their being unable to operate profitably under existing conditions and because of promise that the Great Northern may make the lines pay as a part of a large general system.

The properties involved include 40.35 miles of road from Spokane to Hayden Lake, Idaho; 10.39 miles from Spokane to Flora, and other shorter sections, all of the Spokane & Eastern system, and 88.9 miles of line from Spokane to Moscow, Idaho, and 36.8 miles from Spring Valley to Colfax of the Inland Empire system.

Authority is granted to the new Spokane, Cœur d'Alene & Palouse Railways to issue $860,000 of demand notes and to assume obligation and liability in respect of $442,000 of first mortgage bonds, with the Great Northern assuming liability for the bonds. This came from an agreement of the two original lines to sell all property for about $1,250,000. The Spokane, Cœur d'Alene & Palouse will borrow $860,000 from the Great Northern, giving notes at 5 per cent.

The purchase of the electric "feeder" lines by the Great Northern is in keeping with the general program of electrification of the company in the Pacific Northwest.

Refinancing for Baltimore Company

As the result of a conference held on May 10 a plan is under consideration which involves a change in the capital structure of the United Railways & Electric Company, Baltimore, Md., through the purchase or exchange of one form of security for another. News of this activity was released recently by Alexander Brown & Sons, fiscal agents of the company. They could not now state definitely that such a plan would be approved and if it were what the terms would be and its effect on present securities. However, the plan so far discussed contemplated an offer of 60 per cent of par in cash for income bonds, provided substantially all present holders desired to accept such an offer.

Recent sharp advances in the incomes and other securities were noted, but Alexander Brown & Sons had not participated in this buying and thought it proper that security holders should have this information before them for their guidance.

W. M. Frazee Receiver of the Indianapolis & Cincinnati

Will M. Frazee, Rushville, Ind., has been appointed to succeed the late Charles L. Henry as receiver for the Indianapolis & Cincinnati Traction Company, which is involved in a litigation to foreclose a $2,000,000 mortgage. Mr. Frazee was one of the organizers of the railway and was purchasing agent and claim adjuster until a few years ago, when he disposed of his interests in the line.

Balance in Detroit Increases

For the year ended April 30, 1927, the total operating revenues of the Department of Street Railways at Detroit, Mich., were $24,503,355, against $24,230,554 for a similar period last year. These figures included railway operating revenue for the two years of $21,768,982, against $23,035,168, and a coach operating revenue of $2,734,372 and $1,195,385 for the year ended April 30, 1926. Total operating expenses were $18,918,615, against $18,491,413 for the year ended April 30, 1926. Included in these figures are $16,423,622 and $17,303,345 railway operating expense in 1927 and 1926 respectively and coach operating expense of $2,494,993 and $1,188,068 for the year ended April 30, 1926. Net revenue from all sources was $5,858,718, against $5,952,105. The net income for the 1927 period was $3,190,036, against $3,280,286. The balance for the period was $589,809, against $572,265 in the 1926 period. Total railway passengers numbered 466,644,059, against 495,966,850 in the 1926 period. Total coach passengers were 34,323,201, against 15,903,956 for the year ended April 30, 1926.

$1,795,000 Chicago Rapid Transit Bonds Offered

The National City Company and Halsey Stuart & Company, Inc., New York, on May 17 offered an additional issue of $1,795,000 Chicago Rapid Transit Company first and refunding mortgage 6 per cent bonds, due in 1953, at 93 to yield 6.56 per cent. Net earnings of the company in 1926 applicable interest and reserves amounted to $3,899,565, as against $2,452,850 interest on divisional mortgage bonds, equipment obligations and first and refunding mortgage bonds, including the present issue. The company operates the elevated lines in Chicago.

Springfield Earnings Show Gain

Transportation earnings of the Illinois Power Company, Springfield, Ill., for the year ended Dec. 31, 1926, were $720,727, compared with $708,984 for the year previous. These figures were contained in the income statement of the company submitted to the board of directors covering operations for 1926 compared with the preceding year. The company carried 107,909 fewer revenue passengers than in 1925. Comparative figures showing revenue passengers carried during the past five years are as follows:

1922	11,431,799
1923	11,150,971
1924	10,661,451
1925	11,286,894
1926	11,178,985

Effective on May 15 the schedule of fares on the railway and bus system was revised to eliminate the four tickets for 25 cents rate and the monthly family tickets. In lieu thereof, the report states, rates of two tickets for 15 cents and eight tickets for 50 cents were established, which, plus a 10-cent cash fare, are the rates now in force.

During the year the company purchased two 29-passenger buses to supplement railway service in Springfield, making a total of ten owned by the company.

No public financing was done in 1926 other than the sale of 7 per cent preferred stock on the customer-ownership plan. At the end of 1926 2,801 persons owned stock or were subscribing for it, an increase of 289 over that of the previous year.

Grand Rapids Railroad Accepts Obligations

The City Commission of Grand Rapids, Mich., has passed a city ordinance permitting the Grand Rapids Railway to sell its franchise and privileges to the Grand Rapids Railroad. The new company will accept all the obligations and liabilities of the Grand

Rapids Railway. Prior to the passage of the ordinance, Gerald J. Wagner, the city's consulting engineer, informed the commission that approximately $920,000 of stock of the old company had been deposited in anticipation of the readjustment.

Net Earnings Increase

United Railways, Baltimore, Reports Increase in Revenue Passengers Carried—Improvement Work Continues

After paying all operating expenses and fixed charges, including interest on income bonds, the balance on the United Railways & Electric Company, Baltimore, Md., for the year ended Dec. 31, 1926, was $1,845,839. From this was deducted $818,448 for dividends and $835,785 for depreciation, the balance going to surplus. The facts were included in the annual report to the stockholders. The net earnings of the company over the past five years available for interest payments, after caring for all operating expenses taxes and rentals, but before depreciation have been as follows:

Year	
1922	$4,495,927
1923	4,615,585
1924	4,579,550
1925	4,605,089
1926	4,669,854

COMPARATIVE STATEMENT OF EARNINGS AND EXPENSES OF THE UNITED RAILWAYS & ELECTRIC COMPANY

Operating Income	1926	1925
Revenue from transportation	$16,571,545	$16,481,077
Revenue from other railway operations	144,163	140,142
Total operating income	$16,715,709	$16,621,220
Operating Expenses:		
Maintenance of way and structures	$852,531	$966,995
Maintenance of equipment	917,730	869,908
Maintenance of power	38,968	46,045
Total maintenance	$1,809,230	$1,882,959
Depreciation	835,785	831,061
	$2,645,016	$2,714,020
Power service	1,412,358	1,351,755
Conducting transportation	5,215,053	5,270,167
Traffic	4,164	*4,145
General and miscellaneous	1,528,782	1,464,987
Transportation for investment—Credit	*14,570	*19,973
Total operating expenses	$10,790,804	$10,776,811
Taxes and licenses	1,672,316	1,632,386
Total operating expenses and taxes	$12,463,121	$12,409,197
Net operating income	$4,252,587	$4,212,022
Non-operating income	139,568	120,814
Gross income	$4,392,156	$4,332,837
Interest on funded debt	2,093,415	2,093,415
Remainder	$2,298,741	$2,239,422
Other Deductions from Gross Income:		
Rents	$558,087	$558,809
Interest on unfunded debt	64,544	33,560
Interest on income bonds	559,080	559,080
Amortization of discount on funded debt	58,994	59,388
Miscellaneous	47,980	47,974
Total	$1,288,687	$1,258,813
Net income (transferred to profit and loss)	$1,010,054	$980,609
Seat-miles	1,637,173,845	1,627,061,900
Car-miles	35,304,583	35,717,666
Revenue passengers	225,255,633	224,235,527
Transfer passengers	93,695,891	92,893,828
Revenue passengers per car-mile	6.3878	6.2852
Maintenance cost per car-mile	0.0512	0.0527
Depreciation per car-mile	0.0237	0.0233
Ratio to Total Operating Income:		
Maintenance and depreciation, per cent	15.82	16.33
Operating expenses and depreciation, per cent	64.55	64.84
Taxes, per cent	10.00	9.82
Operating expenses, depreciation and taxes, per cent	74.55	74.66

* Credit.

Since 1906 the company has set up depreciation reserves aggregating $15,150,000, out of which more than $13,630,000 has been put back into the property for reconstruction and improvements and for property retired, leaving a balance of $1,520,541 in the reserve account. During the past five years the company spent $13,594,216 for maintenance and depreciation.

In 1926 the company reconstructed 15.2 miles of track. During the past eight years 131.8 miles of track was reconstructed, or nearly one-half of all the tracks in city streets are under frequent service. Twelve additional articulated cars were constructed in the company's shops. The total number of this type that has been constructed and is now in service is 34. There have also been constructed and placed in operation eleven cars of the permanently coupled type.

The agreement with the employees covering wages and working conditions terminated on Dec. 31, 1926. As a result of a conference with representatives of the employees' association, a two-year agreement was reached effective Jan. 1, 1927, providing for an increase in wages of all employees of 1 cent per hour for 1927 and a like additional increase for the year 1928.

During the year the company, in conjunction with the United Railways Association of Baltimore, an organization of employees, expended for free medical and nursing attendance $86,950 and for pension and insurance payments $111,464. Effective March 23, 1926, the company placed $5,000,000 in life and permanent disability insurance for its 5,000 employees.

On the subject of bus service the report states that the company now owns or controls practically all the buses operating within Baltimore city and suburban territory. In addition, the company owns what is known as the "Gray Line," sightseeing tours.

Reference was made to a survey made in Baltimore in the fall of 1926. In that report it was disclosed that of the more than 765,000 persons who daily entered and left the business section other than by walking more than 67 per cent used the street cars, 2.3 per cent used buses, 1.5 per cent used taxis and 29.2 per cent used private automobiles. Street cars carrying two-thirds of the traffic represented 12 per cent of vehicles used, against 88 per cent of automobiles.

In a belief that an explanation of what became of the fare would interest stockholders and the public C. D. Emmons, president, shows in the report the diminishing returns of the 7½-cent adult ticket fare. The average fare received by the company is 7.31 cents because of the lower rate of fare to children and commuters. He explains thus:

Of this 7.31 cents—

Approximately $5\frac{4}{10}$ cents or...5 42/100 cents was paid to employees for wages; to manufacturers for necessary supplies and material; to the tax collector and for depreciation.

5.4c

Approximately $1\frac{4}{10}$ cents or ...1 46/100 cents was paid for property rented and for money borrowed. (This represents the company's bonded debt held by approximately 115 Savings and other Banks in Maryland; and approximately 12,000 individual investors.)

1½c

Approximately ⅓ cent or...35/100 cent was paid to 2,242 stockholders.

The balance was credited to surplus.

Quarterly Surplus in Philadelphia $15,503

The quarterly income account of the Philadelphia Rapid Transit Company, Philadelphia, Pa., and some passenger statistics are shown in the accompanying table.

INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT COMPANY FOR THE QUARTER ENDED MARCH 31, 1927

Operating revenue	$14,489,838
Operation and taxes	10,986,995
Operating income	$3,502,842
Non-operating income	209,845
	$3,712,687
Payments to City:	
Sinking fund and Frankford Elevated	240,049
	$3,472,638
Fixed charges, dividends and management fee	3,457,134
Surplus	$15,503

PASSENGER STATISTICS OF THE PHILADELPHIA RAPID TRANSIT COMPANY FOR THE QUARTER ENDED MARCH 31, 1927

	Passenger Revenue	Passengers Carried	Average Rate in Cents per Passenger
Surface, subway and elevated	$12,055,626	229,020,898	5.26
Motor bus	690,623	7,552,880	9.14
	12,746,250	236,573,778	5.39
Taxi	1,545,682		
Total	$14,291,932		

Indianapolis February Statement Reports on Depreciation Fund

Gross earnings of the Indianapolis Street Railway, Indianapolis, Ind., for the month of February this year totaled $451,207, a decrease of $9,472 compared with the corresponding month last year, it was shown in a report just filed with the Indiana Public Service Commission. Operating expenses decreased $11,378, having totaled $334,561 this February. Net earnings for that month this year from operation were $116,646, compared with $114,740 for February of last year.

An interesting sidelight in the document is contained in the special report on the depreciation reserve fund, which to date shows a deficit of $336,809. When the present fares were put into effect several years ago by the company it was understood that all surplus should be held in a depreciation reserve account, available for use only in the rehabilitation and repair of equipment. The members of the Indiana Public Service Commission had estimated that the higher fares would account for an increase of approximately $500,000 in the company's revenues, but the reverse proved true. The depreciation reserve account since the first has stood in the red, mounting higher and higher each month.

New Director in Savannah.—George H. Baldwin, Jacksonville, was recently elected a member of the board of directors of the Savannah Electric & Power Company, Savannah, Ga., to succeed his father, the late George J. Baldwin.

Capital Increased. — The Kentucky Power Company, Augusta, Ky., which recently purchased the electric utilities at Maysville, Ky., from the Cochrane interests, has filed amended articles for the Maysville Street Railroad & Transfer Company, increasing the capital from $107,000 to $157,000.

Galveston-Houston Issue Offered.—Lee, Higginson & Company, Estabrook & Company, Parkinson & Burr and Stone & Webster and Blodget, Inc., are offering an additional issue of $1,200,000 Galveston-Houston Electric Company secured gold notes, series B, 6 per cent, June 1, 1931, at 97.41.

Final Hearing on Valuation of Easements.—The Maryland Public Service Commission has set May 26 as the date to hear the final arguments on the valuation of easements of the United Railways & Electric Company, Baltimore. In the valuation case held some time ago the commission placed a total value of $77,000,000 on the company's property, $7,000,000 being for easements. It was contended by the people's counsel that these easements should not be included and the case reached the courts. The Court of Appeals held that the method used by the commission in valuing the easements was wrong but the placing of a valuation was upheld.

Reports Operating Loss for 1926.—The Hammond, Whiting & East Chicago Railway, Hammond, Ind., operated at a loss of $11,619 during 1926, according to a report filed with the Indiana Public Service Commission on April 30. Total revenue for the year was $22,520, according to the statement. The road carried 328,290 passengers, who paid an average fare of 7.73 cents. Approximately 33 miles of track is contained in the system, which connects with the Chicago City Railway.

San Jose Gross Is $13,754.—The San Jose Railroads, operating in San Jose, reports to the California Railroad Commission its 1926 operating revenue at $385,545 compared with $389,550 for 1925. The operating expenses, excluding taxes, are $348,034 for 1926 and $343,033 for 1925, leaving net operating revenue of $37,511 for 1926 and $46,517 for 1925. During 1926 taxes charged to operation amounted to $25,265 and for 1925 to $25,426. Deducting the taxes leaves operating income of $12,245 for 1926 and $21,091 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents a gross corporate income remains (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $13,754 for 1926 and $22,921 for 1925.

Threatening Situation in Johnson City.—The Johnson City Traction Corporation, Johnson City, Tenn., is suffering from enormous inroads on its revenue and traffic by buses and private passenger cars. So serious has the situation become that it is stated that unless traffic improves it will become necessary to discontinue the operation of the system. At the present time the company is operating only five cars. Its traffic is only about half what it was several years ago.

Surplus for Nine Months Lower.—For the nine months ending March 31, 1927, the total revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was $46,793,095 an increase of $812,288 over the corresponding period of last year. Expenditures for operating and maintaining the property increased $1,545,509. Taxes payable to the city, state and the United States increased $169,547. Rentals and other income deductions decreased $46,016. The net result for the nine months was a surplus of $507,687, against a surplus of $1,364,439 for the corresponding period of last year. The comparison is influenced by the strike during the month of July, 1926, as well as the fact that in July of 1925 there was a lump sum payment of $770,000 on account of the new advertising contract, against which there was no similar payment this year.

Bank Files Claim Against Chicago Railways. — The Illinois Merchants Trust Company, Chicago, as trustee for $33,866,631 series A, B and C twenty-year bonds of the Chicago Railways, filed a priority lien on May 6 against the railway in the United States District Court. The action was taken to protect the claim of these bonds to a place second only to the first mortgage bonds, of which the Harris Trust & Savings Bank, Chicago, is trustee, in the distribution of the assets of the company in case of foreclosure. The railway passed into the hands of receivers on Feb. 1, when its twenty-year franchise expired.

$54,811 Gross Income in 1926.—The San Francisco, Napa & Calistoga Railway, operating from Vallejo to Calistoga, reports to the Railroad Commission its 1926 operating revenue at $231,199 compared with $246,913 for 1925. The operating expenses, excluding taxes for 1926, are reported at $164,816 and at $157,322 for 1925, leaving net operating revenue of $66,383 for 1926 and $89,591 for 1925. During 1926 taxes charged to operation amounted to $14,708 and for 1925 to $16,928. Deducting the taxes leaves operating income of $51,675 for 1926 and $72,662 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $54,811 for 1926 and $76,383 for 1925.

Net Operating Income $40,000 a Month.—Substantial decreases in operating expenses have enabled the Omaha & Council Bluffs Street Railway, Omaha, Neb., to keep the red out of its net income. Revenues are now running about $240,000 a month, or about 3 per cent less than a year ago, but a reduction of expenses has enabled the company to show a net operating income of $40,000 a month. This leaves about $2,000 a month above interest and taxes. These figures do not include the bridge revenues nor that part of the system which is operated in Iowa. The first seven days in May showed revenues of $56,471, against $58,325 for the corresponding period in 1926.

Will Abandon Schomberg Line.—The Toronto Transportation Commission, Toronto, Ont., plans to abandon the Schomberg radial line. It runs a distance of 14.4 miles through somewhat poor country. Schomberg is about 15 miles from Toronto. The commission says it has been losing money yearly on the Schomberg proposition. A recent editorial in the Toronto *Star* suggested that Schomberg should not lose its freight connection with the Canadian National Railway. The government-owned road should acquire it and use it for freight purposes only, under which it might pay.

Would Discontinue Freight Service.—The Schenectady Railway applied to the Public Service Commission on May 9 for permission to discontinue on June 1 freight service on all of its lines between Schenectady and Ballston Spa, between Schenectady and Albany and between Schenectady and Troy. It states that for a number of years it has been operating this electric freight business at a loss.

Gross Corporate Income $34,252.—The Central California Traction Company, operating from Sacramento to Stockton, reports to the California Railroad Commission its 1926 operating revenue at $490,526 compared with $592,036 for 1925. The operating expenses, excluding taxes for 1926, are reported at $440,444 and at $483,069. for 1925, leaving net operating revenue of $50,082 for 1926 and $108,966 for 1925. During 1926 taxes charged to operation amounted to $30,049 and for 1925 to $31,195. Deducting the taxes leaves operating income of $20,033 for 1926 and $77,771 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $34,252 for 1926 and $94,727 for 1925.

Twelve-Mile Line Abandoned.—The Public Service Commission of Oregon on May 10 authorized the Portland Electric Power Company to suspend operation of its suburban line from Montavilla to Troutdale, a distance of about 12 miles. This route has been losing money for some time as the residents of these towns use either private cars or the bus line for transportation.

Personal Items

New Directors and Vice-President for Georgia Power Company

Four new directors from as many cities in Georgia have been elected by the Georgia Power Company, Atlanta, Ga. They are: Billups Phinizy, president of the Southern Mutual Life Insurance Company, in Athens; John M. Graham, president of the National City Bank, Rome; George E. Patterson, executive vice-president of the Fourth National Bank of Macon, and J. Leonard Rountree, president of the People's Bank of Summit, Georgia, and a former state legislator from Emanuel County.

At the same meeting William E. Mitchell, Birmingham, was elected vice-president and general manager of the company, to succeed W. H. Taylor, who resigned several months ago to become vice-president of the United Gas Improvement Company. Mr. Mitchell, for many years a leading figure in the water power development of the South, is one of the best known men in electrical circles in the country.

Personnel Changes on Market Street Property

Effective May 10, M. McCants was appointed vice-president in charge of transportation and J. M. Yount vice-president in charge of equipment and maintenance of the Market Street Railway, San Francisco, Cal. In announcing the changes the management expressed the desire to place Mr. McCants in a position where he could devote his entire time to transportation. In appointing Mr. Yount to the vice-presidency in charge of equipment and maintenance the management has delegated to him the supervision of all work connected with shops, tracks, overhead lines, cables and substations. Messrs. Legare, Bivins, Foster, Peterson and Delaney will report to Mr. Yount. J. W. Delaney, effective May 11, was appointed superintendent of equipment.

In accord with the Byllesby policy of making promotions and advancements from its own personnel, five other Market Street Railway men have been appointed, as follows:

F. W. Allen, commercial manager. He was formerly superintendent of Geneva division, a position he has held since Nov. 1, 1902. Mr. Allen entered the service of the company on June 23, 1894, as a motorman at Geneva division. Later he became clerk and car dispatcher, ultimately receiving the title of division superintendent.

The post vacated by Mr. Allen will be filled by E. H. Lincoln, who has been assistant superintendent of McAllister division since Sept. 1, 1924. Mr. Lincoln entered the service of the company as a conductor at 28th Street division. Later he became a clerk. On Sept. 15, 1923, he joined the bureau of employment and training as instructor of conductors.

P. O'Marie, superintendent of ferry terminals since 1921, becomes superintendent of Sutro and McAllister divisions. Mr. O'Marie was employed as a motorman in May, 1901, at Turk and Fillmore division on the old Park and Ocean line. He remained with the line when it was transferred to Oak and Broderick division in 1903. In the same capacity he went to Sutro division in 1908, where he remained until 1915, when he was made inspector at Turk and Fillmore. His appointment as division superintendent of Sutro will enable Superintendent John P. Jones to devote more time to his rapidly growing Turk and Fillmore and Washington and Mason divisions.

Byron Gunn leaves his place as starter at Third and Townsend Streets depot, where he has been since 1916, to become superintendent of ferry terminals. He joined the company as a conductor in 1909.

H. L. Sanders Heads Cincinnati Car Company

Henry L. Sanders, former vice-president of the Cincinnati Car Company, was elected president of the company on May 17; A. L. Kasemeier was reelected vice-president in charge of sales; J. Howard Elliott was elected vice-president in charge of production and purchases; E. C. Bernhold was elected treasurer and will continue as secretary. Thomas Elliott will continue to serve the company as consulting engineer. Among other officials are Charles J. Ellis, who will be chief engineer and assistant to the vice-president in charge of production, and Dave M. Ritchie, who will be sales engineer and assistant to the vice-president in charge of sales. S. E. Reith will remain as assistant secretary and assistant treasurer.

J. P. Alexander Westinghouse New England Manager

J. P. Alexander has been made Boston manager of the Westinghouse Electric & Manufacturing Company in charge of all sales and service in New England. During the twenty years that he has been associated with Westinghouse Mr. Alexander has become a prominent figure in the electrical industry in New England and has gained a wide experience which makes him particularly fitted for the responsibilities of his new position.

Mr. Alexander was born in Chambersburg, Pa., and attended Chambersburg Academy, which at that time was conducted by his father. He graduated from Lafayette in 1907 with the degree of electrical engineer and enrolled on the Westinghouse company's apprentice course at East Pittsburgh in July of that year.

Upon completion of the apprentice course he entered the railway department at East Pittsburgh and remained there until 1911, when he went to the Boston office as railway engineer. In 1913 he became a railway salesman, located in the Springfield, Mass., office, and two years later went to the New Haven, Conn., office as railway and central station salesman.

He was made manager of the transportation division at Boston in September, 1922, and manager of the New Haven, Conn., branch office in 1924.

Archie G. Andrews, for twenty-three years with the Rockford & Interurban and the Rockford City Traction Companies, Rockford, Ill., has been appointed superintendent of operation of the Royal Rapid Transit Company, Madison, Wis., in active charge of 400 miles of bus routes. During his association with the Rockford traction interests he advanced from conductor to trainmaster, in which capacity he served for seven years. During the last two years he has been superintendent of transportation.

Obituary

George E. Maltby

George E. Maltby, vice-president and formerly general manager of the Jamestown Street Railway, the Jamestown Motor Bus Transportation Company and the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., died suddenly at Los Angeles, Cal., on April 29, where he had been spending the winter.

Mr. Maltby was a familiar figure in the electric transportation era and had been identified with the Broadhead interests in various executive capacities almost since its inception in the late '80s. Some time ago he relinquished active control of the lines on account of ill health, but retained the title of vice-president.

Clyde F. Kalp

Clyde F. Kalp, treasurer of the West Penn Railways, Pittsburgh, Pa.; the West Penn Power and a number of other public service companies, is dead. He started as a new-business solicitor for the West Penn Power Company at Connellsville, Pa., early in 1910. In 1915 he was transferred to the Pittsburgh office of the company and spent several years in the research department, and later was engaged in the construction of the Windsor power station. Some months after the declaration of war Mr. Kalp was graduated as a first lieutenant of infantry from the training school at Fort Oglethorpe, Ga. He later was attached to the 52d Infantry, Sixth Division, and also served as an instructor at several army camps in the South.

He returned to Pittsburgh in 1919 and entered the treasury department. Through diligent application to his duties he was made assistant treasurer, and upon the death of C. C. McBride was elected treasurer of the West Penn companies on May 20, 1925.

Besides being treasurer of the West Penn Railways, Mr. Kalp was an officer or director in many other companies, among them being the Allegheny Valley Street Railway, Monongahela West Penn Public Service Company and the Wheeling Traction Company.

Mr. Kalp was born at Mount Pleasant, Pa., on May 4, 1891. He was graduated from the local public schools.

R. S. Maddock, superintendent of equipment of the United Electric Railways, Providence, R. I., died on April 23. Since he became superintendent many improvements were placed in effect and he had a campaign planned many months in advance which in the words of *All Aboard*, the official publication of the company, would have made the repair shop second to none. Mr. Maddock entered the service of the United Electric Railways on March 18, 1923, as assistant superintendent of equipment. He was appointed superintendent of equipment on May 1, 1926, at which time W. D. Wright, then superintendent of equipment, retired. Mr. Maddock was 44 years old.

John Mooney, superintendent of the Flatbush division of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died recently. Mr. Mooney was 48 years old. He entered the service of the company many years ago as a trainman and was promoted successively through the various posts to the position at Flatbush, a post he had filled for a long time.

Frank S. Elgin, at one time co-receiver with T. H. Tutwiler of the Memphis Street Railway, Memphis, Tenn., died recently. His receivership embraced other utilities in Memphis before they emerged from financial troubles about the time of the World War. Mr. Elgin was a prominent lawyer and a former United States marshal for the western division of Tennessee.

Amos Caverly, driver of the first horse car in Minneapolis, Minn., died recently in that city, where he had lived since 1871. Mr. Caverly was 82 years old. He always maintained a great interest in the railways. He liked to tell of the first electric car installed for demonstration purposes and of his many experiences, which would seem somewhat out of the ordinary at the present time. Before he went to Minneapolis he operated a car on the lines of the local railway in Lowell, Mass. He was born in Newport, Me.

Viscount Cowdray, English financier, builder of tunnels, a developer of Mexican, Persian and Russian oil fields, died in Aberdeen, Scotland, on April 30. W. D. Pearson, who later became Lord Cowdray, headed the firm of S. Pearson & Company, public utility contractors, founded by his grandfather in 1889. The engineering feat which won him most renown in America was the construction of the Pennsylvania Tunnels at New York. At the age of 21 he took charge of his first contract. Under his management S. Pearson & Company became internationally prominent. He successfully completed the tunnel under the Thames at Blackwall, a pioneer accomplishment, and went on to contract for every kind of public works, varying from the railways and harbor docks to water works and drainage systems. Lord Cowdray was born in 1856. He was educated in a private school and was early trained in the business that had been founded by his grandfather.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

World Clinic on Economic Ills Goes Forward in Geneva

Leaders of Forty-seven Countries Discuss Methods of Recovery and Agree as to Diagnosis—Unemployment and the Interdependence of Nations Among the Outstanding Topics

BY EDWARD J. MEHREN
Vice-President McGraw-Hill Publishing Company, Inc.
Staff Correspondent in Attendance

GENEVA, May 5—For two days representatives of 47 countries have been listening to a diagnosis of the world's economic difficulties. Twelve countries have been heard from. The encouraging feature is that the diagnoses agree—surely a good basis for the discussion next week, in committee, of the details of remedies.

What is the diagnosis on which the speakers, each speaking for his delegation, so far agree? There are, so they indicate, a number of diseases: First, that purchasing or consumptive power was curtailed by the war; second, that many trade barriers, and not merely high tariffs, have been erected, such barriers as fluctuating exchanges, high freight rates, troublesome customs formalities, quickly changed tariffs, which discourage long-time contracts, etc.

Of these diseases the restriction of purchasing power was most frequently stressed, but suggested remedies were not so readily forthcoming. Prof. Karl Gustav Cassel (Sweden), in a learned address, intimated that the restored purchasing power of backward countries might be a powerful stimulus if capital for their development were forthcoming in larger volume, and Karl F. von Siemens (Germany), again by intimation, pointed out the burdens to industry caused by the expansion of government functions and government intervention in industry. Dr. Zimmerman (Holland) also developed the same thought. Enlarged government functions withdraw men from productive enterprise and make them a tax on industry and thus on consumption. Government interference also burdens industry. The result is the reduction of purchasing power. Among government interventions Herr von Siemens cited high customs or tariffs not justified by natural differences, import prohibitions, export bounties and wage regulation. All these mislead industry into self-sufficiency, discourage technical progress and, in sum, depress the standard of life.

Answer All Questions
On the EXHIBIT SPACE BLANK
for the
A.E.R.A. Convention
Each Unanswered Question
Means a Delay
If You Hesitate Now You Will Repent Hereafter

As to trade barriers, the International Chamber of Commerce, represented in the discussion by Walter Runciman, has proposed the stabilization of tariffs, that is, that tariffs shall not change too often and without due notice.

UNEMPLOYMENT DISCUSSED

Naturally the question of unemployment has been very fully traversed, for it is recognized as one of the most serious results of Europe's economic dislocation. It is inevitably tied up with lack of purchasing power and the remedy for the latter is necessarily found in the remedy for the former. But in the handling of this subject there has been a solicitude that goes beyond its consideration as a cold economic fact. The human distress is keenly felt and expressed.

INTERDEPENDENCE OF NATIONS

One other point secured universal agreement—that nations are interdependent and that their dislocations react on each other. In fact the conference itself is the best evidence that the interdependence is a moving thought of all the countries of Europe.

Of tangible suggestions was Herr von Siemens' comment on the conditions necessary for international cartels, a subject sure to receive much discussion. He suggested that they were feasible only under three conditions: (1) that the industries in countries concerned must be accustomed to co-operate and come to an understanding; (2) that constituent national groups can only be formed where the number of those concerned is not too large, and (3) that the agreements must cover a commodity which is clearly definable and also comparable.

Dr. Zimmerman stressed the growing importance for present industrial countries of their potential home market, since backward countries tend to establish their own industries and thus cut down their imports of manufactured goods. This means an effort to increase home consumption and therefore to raise the standard of living.

Mr. Jouhoux (France) proposed the organization of two economic bodies, one to meet at least every three years to lay out the policies for the second body, which would be a standing economic council to carry on through committees studies of important economic questions.

Finally, to an American, there was a special appeal in two points of Herr von Siemens' address: his appeal, first, for the preservation of individualism and, second, for openmindedness and flexibility in one's economic and industrial attitude.

POSSIBLE RESULTS

What will be the result of this world conference?

The question is asked and answered dozens of times each day between sessions and in hotel corridors. The answer is always the same: Do not expect too much. The problems are extremely complex. The solution must be worked out slowly. But the groundwork can be laid here. The superstructure will come at a later similar gathering. Walter Runciman (England) put the broad fundamental well in these words: "Those who are concerned to maintain business prosperity in all countries are convinced that a mutual understanding in international economic and business problems is the surest guarantee for a growing volume of trade and for the maintenance of the higher standards of life and comfort which are the legitimate aspirations of modern democracy."

Interstate Public Service Orders Six Interurban Cars

Following are specifications for the six one-man, two-man interurban cars ordered April 8 by the Interstate Public Service Company, Scottsburg, Ind., from the G. C. Kuhlman Car Company, Cleveland, upon which delivery has been promised in 90 days:

Number of units	6
Type of unit	One-man, two-man, motor, passenger, interurban, double-end, double-truck
Builder of car body	Kuhlman
Date of order	4-8-27
Date of delivery	90 days
Weights:	
Car body	19,624 lb.
Trucks	10,000 lb.
Equipment	7,876 lb.
Total	37,500 lb.
Bolster centers	22 ft.
Length over all	45 ft. 6 in.
Length over body posts	33 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. ¾ in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Doors	Four, end
Air brakes	Westinghouse, variable load
Armature bearings	Plain
Car signal system	Faraday high-voltage and Westinghouse type 8-T
Compressors	DH 16
Conduit	Flexible
Control	HL
Couplers	Tomlinson, Form 110
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Cleveland
Finish	Pratt & Lambert enamel
Floor covering	Battleship linoleum
Gears and pinions	Nuttall helical
Glass	Plate and standard
Hand brakes	Brill, stop handle
Heaters	Consolidated, truss plank
Headlights	Imperial type WDF
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	3½x6, plain
Journal boxes	Brill
Lamp fixtures	G.E. short-circuiting fixtures
Motors	Westinghouse 510 E, No. 4, inside hung
Paint	Orange
Roof material	Canvas
Safety car devices	National
Sanders	Nichols-Lintern
Sash fixtures	Curtain Supply Co.
Seats	Brill No. 201-A
Seat spacing	36 in.
Seating material	Genuine leather
Steps	Three, one folding
Step treads	Kass and Sahkar
Trolley	Retrievers, Knutson No. 5
Trolley base	Ohio Brass, Form 4
Trolley wheels	Moor Jones, 6 in.
Trucks	Brill 177-E, 1X
Ventilators	Brill, car type
Wheels	Rolled steel, 28 in.
Special devices	Minier window wipers, Drew motorman's mirrors

Copper Breaks Through 13 Cents—Business Quiet

NONE of the non-ferrous metal markets was active during the week ended May 18 and prices for each of the major metals were lower, according to *Engineering and Mining Journal*. On May 18 copper could be had at 12.875 cents in Connecticut, zinc at 6 cents in St. Louis and lead at 6.60 cents in New York. These are new low levels for both zinc and lead for several years. Platinum has weakened further, whereas antimony, quicksilver and tin have shown little net change.

On May 12 a fair business was done in copper at 13 cents delivered in the Connecticut Valley. Since then, however, buyers have shown practically no interest in the market. Small sales have been made at 13 cents in the East and 13¼ in the Middle West, and on May 18 first hands sold at 12.875 cents delivered in Connecticut. Although producers until this date had held consistently at 13 cents—some of them are still asking this figure—a fair tonnage of second-hand metal for May delivery has changed hands at prices ranging from 12.825 cents to 12.875 cents. Various interpretations are placed on the April statistics that appeared last Thursday, but it is clear that consumers are not greatly impressed. Foreign business has been quiet, with Copper Exporters, Inc., maintaining its price at 13.35 cents c.i.f.

Lead has sold in reasonable volume during the past week, though it has been distinctly a buyers' market. The American Smelting & Refining Company maintained its New York contract price at 6.75 cents until Monday, when, on hearing of price concessions by other sellers, it was reduced to 6.65 cents. The reduction was accepted as a matter of course by buyers and did not stimulate business to any great extent. With the St. Louis market down to 6¼ cents, there would seem little reason for any one paying more than 6.60 cents, New York basis, for the freight rate from St. Louis is only 35 cents per 100 lb. Most of the buying has been for May shipment, though producers would gladly sell in two or three months ahead at the same price. Battery manufacturers continue conspicuous by their absence from the market.

Buying of tin has been spotty, with no great excitement in the market. Spot supplies continue almost unob-

ELECTRIC RAILWAY MATERIAL PRICES—May 17, 1927

Metals—New York

Copper, electrolytic, cents per lb.	12.70
Lead, cents per lb.	6.625
Nickel, cents per lb.	35.00
Zinc, cents per lb.	6.37
Tin, Straits, cents per lb.	67.00
Aluminum, 98 or 99 per cent, cents per lb.	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.425
Somerset mine run, Boston	1.875
Pittsburgh mine run, Pittsburgh	2.10
Franklin, Ill., screenings, Chicago	‡
Central, Ill., screenings, Chicago	‡
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 9/16 in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.95
Steel bars, cents per lb.	1.85
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb.	2.90
Sheet iron, galvanized (24 gage), cents per lb.	3.75
Galvanized barbed wire, cents per lb.	3.20
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12–17.50
Colored	7–14

‡ Quotations withdrawn because of strike.

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.6
White lead in oil (100 lb. keg), cents per lb.	14.50
Turpentine (bbl. lots), per gal.	$0.625
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.00
Rubber-covered wire, No. 14, per 1,000 ft.	$5.15-20
Weatherproof wire base, cents per lb.	16.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$130
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y	1 00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.00
Light copper, cents per lb.	9.50
Heavy yellow brass, cents per lb	7.00
Zinc, old scrap, cents per lb.	4.00
Lead, cents per lb. (heavy)	5.375
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	14.50
Rails (short), Chicago, gross ton	16.25
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.50

tainable, so the prices are largely nominal. August tin can be obtained at concessions of 3 to 4 cents from the prices asked for spot. Quotations for 99 per cent tin cover delivery in a week or two. Spot 99 per cent is unobtainable in any quantity.

In spite of a great deal of talk, zinc miners in Joplin continue to produce about 13,500 tons of concentrate per week, against sales of about half that quantity in each of the last two weeks. The price has been cut to $38 and it is possible that material curtailment will be brought about soon. Price of slab zinc has declined from day to day during the week, with the bulk of the business on May 17 and 18 being done at 6 cents. High grade is nominally at 8 cents in the Eastern district.

$350,000 Improvement Program for Utah Company

The Utah Light & Traction Company has reported that it is about to undertake a $350,000 improvement program. The announcement of the proposed project was made by E. O. Howard, president of the company, at a luncheon in Salt Lake City recently.

Rock Island Places Five Electro-Gas Cars in Service

Five electro-gas-driven cars have recently been delivered to the Chicago, Rock Island & Pacific Railroad. They will replace steam train service on branch lines. The cars will accommodate 77 passengers. Their motors develop 275 hp. and provision has been made for the installation of another motor of the same rating. They are designed at present to haul one trailer. General dimensions are as follows: Engine room, 10 ft.; baggage and express compartment, 11 ft. 6 in.; smoking room, 9 ft.; main compartment, 38 ft.; width, that of a standard steel coach.

The cars were designed by J. E. Wanamaker, chief electrical engineer of the Rock Island, and they were jointly built by the St. Louis Car Company, Electro-Motive Company, Winton Engine Company and General Electric Company.

The car trucks are of the cast-steel type, and the frames, of one piece, were furnished by the Commonwealth Steel Company, East St. Louis.

Duco lacquer of olive green color, the Rock Island standard, was chosen for the outside finish. The inside trim is of Honduras mahogany, natural finish. Ample basket racks are conveniently located for the passengers. Toilet and drinking fountain facilities are located in the rear end of the main passenger compartment.

The Rock Island converted two of its 45-ton steel cars into gas-electric units of this type. Work was done in the company shops at Horton, Kan.

In addition to the five passenger cars the Rock Island, in its own shops at Horton, Kan., has completed the conversion of two 40-ft., 45-ton steel cars into two gas-electric units, each being equipped with two sets of 275-hp. units, the motors being designed with sufficient capacity for use in continuous low-speed heavy freight service. These power plants are so built and installed that they can be controlled as one unit, with a total capacity of 550 hp. The engine man is able to run one or both power plants to meet the schedule requirements, cutting the power plants in or out as may be necessary for capacity and economy. One power plant handles the motors on the forward truck and the second one handles the motors on the rear truck. Twenty of the 40 ft. in the car is left for use for revenue service.

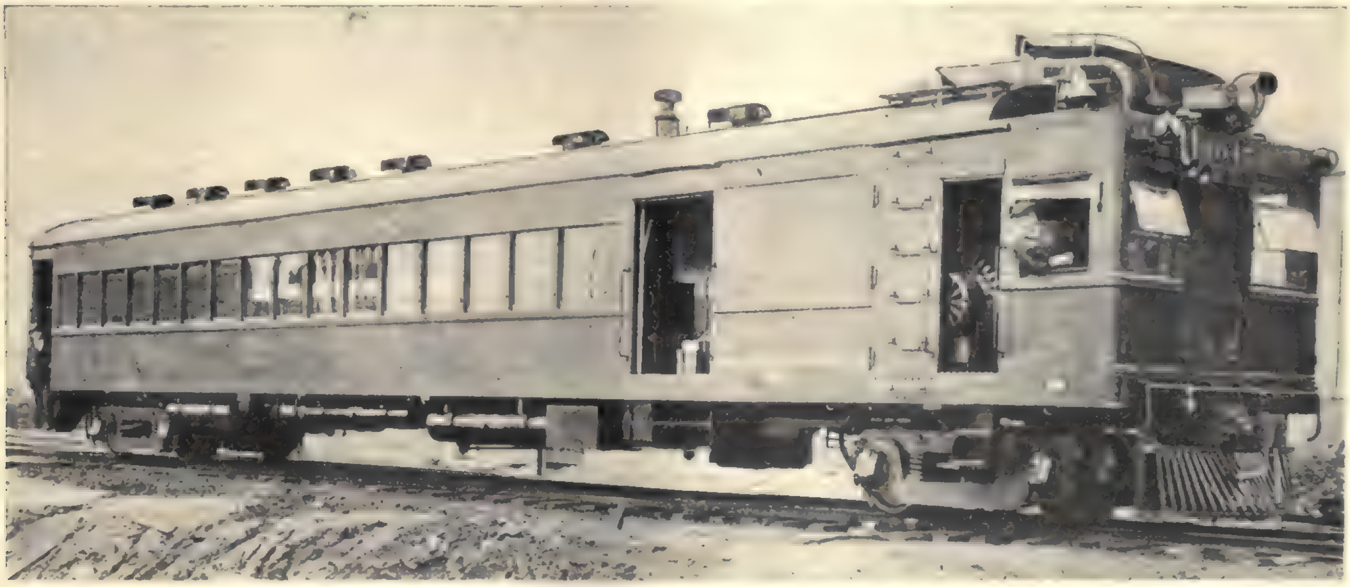
The cars as converted weigh approximately 75 tons each and are designed for pulling two or three trail cars in regular local passenger service. One of these two cars was first equipped with a low gear ratio so as to carry on some experimental work to determine their adaptability for light switching and light local branch line freight service. Upon completion of the experiments the low ratio gears were replaced with standard passenger gears, as the cars are to be used in local passenger service.

F. R. Fageol Heads New Ohio Company

F. R. Fageol, first vice-president of Fageol Motor Company of California, and formerly vice-president and director of American Car & Foundry Motors Company, with which Fageol of Ohio was merged in 1925, is now president of Twin Coach Company, a newly organized corporation. The company was founded by a group of Northern Ohio capitalists, and will begin operations shortly in the former Fageol Motors Company plant at Kent, Ohio. The Twin Coach Company is a Delaware incorporation, with capital of $4,000,000 of 8 per cent preferred and 400,000 no par common shares.

Secretary of Commerce to Address Trade Convention

Foreign traders from 40 states will listen in Detroit to an address by Secretary Hoover to be made May 26 at the fourteenth National Foreign Trade Convention. The convention will meet on May 25, 26 and 27 and 2,500 foreign traders are expected to attend. The Secretary's subject will be "American Foreign Trade" and a nation-wide radio



Five of these electro-gas units were recently placed in service by the Rock Island to replace steam trains on branch line service audience will listen in to what is anticipated to be one of the notable business addresses of the year.

More than 40 speakers, prominent in all phases of the country's foreign trade activity, will address the convention's thirteen group and general sessions. Some of those who appear on the program include Julius H. Barnes, president of the Barnes-Ames Company, New York; W. F. Gephart, vice-president of the First National Bank, St. Louis; Turner Jones, vice-president of the Coca Cola Company, Atlanta; Prof. L. D. O'Neil of Boston University; John A. Russell, editor of the *Michigan Manufacturer and Financial Record;* W. C. Sproull, advertising manager of the Burroughs Adding Machine Company; ex-Gov. James P. Goodrich of Indiana; J. A. H. Kerr, vice-president of the Security Trust & Savings Bank, Los Angeles; Robert V. Beucus, advertising manager of Bauer & Black, Chicago, and C. C. Martin of the National Paper & Type Company, New York.

New Financing Plan Proposed for Seattle Cars

A new plan for financing the purchase of new street cars for the Seattle Municipal Street Railway, Seattle, Wash., despite pending litigation which has apparently closed the market to railway department bonds, is under consideration by the City Council. The plan would not enable the city to procure at once the 80 new street cars which were authorized in an ordinance for the sale of $1,420,000 in bonds enacted before the railway became involved in the litigation, but it would provide funds for the railway department to buy the cars in lots of perhaps four or five. Councilman Ralph D. Nichols suggested the plan. Under it funds set aside annually by the water department into a sinking fund for bond redemption would be used to purchase interest-bearing utility warrants issued by the railway, the proceeds of these sales to be used by the railway in purchasing new cars.

The suggestion was prompted by an ordinance which came before a committee of the Council authorizing the investment of $78,000 from the water bonds redemption fund in street railway warrants, issued two years ago for the construction of the Fifteenth Avenue Northeast extension of the railway system. These warrants are bought by private firms at a discount of 8 per cent from their face value.

Rolling Stock

Brooklyn & Manhattan Transit Corporation, Brooklyn, N. Y., placed in service last week the first of the 67 articulated cars ordered nearly a year and a half ago, and which were mentioned in the JOURNAL for Dec. 25, 1926. Eight additional units will be ready within a few days. The new car is running on the Fourth Avenue line between 95th Street and the Queensborough Plaza.

Petaluma & Santa Rosa Railroad, Petaluma, Cal., has been authorized by the Railroad Commission to remodel its passenger equipment in order to operate the same as one-man safety type cars with dead-man control. This action was taken by the commission following a hearing conducted by Commissioner Leon O. Whitsell at which the utility submitted its record of earnings showing deficits as follows: 1926, $36,401; 1925, $26,133; 1924, $26,006; 1923, $33,270; 1922, $16,287. The utility operates three lines from Sebastopol, Sonoma County. The use of one-man cars is proposed for a period of six months as an economy measure. Rigid safety regulations are contained in the commission's authorization for the operation of one-man cars. The system comprises 33 miles of track.

Track and Line

Oregon Electric Railway, Portland, Ore., has agreed to pay 30 per cent of the $60,000 cost of an overhead crossing above its tracks on the Capitol highway at Multnomah station.

Seattle Municipal Street Railway, Seattle, Wash., has been authorized by the City Council to make four extensions to the city's street railway lines, to cost $52,500. Three of the improvements will be in the University district and the other in the southern end of the city.

Worcester Consolidated Street Railway, Worcester, Mass., is prosecuting work on the many improvements involving an expenditure of $1,500,000 in that city. A force of 150 men is relaying double track in Park Avenue from May Street to Main Street, a distance of 7,000 ft.

Municipal Railway of St. Petersburg, Fla., is relaying rails on the Big Bayou line at the approaches to the new concrete arch bridge over Salt Creek.

Wisconsin Traction, Light, Heat & Power Company, Neenah, Wis., and the **Wisconsin Power & Light Company** have agreed to use the same car tracks in Neenah. The track formerly used by the cars from Appleton will be torn up. Both companies will use the tracks over which the Oshkosh cars were formerly operated. A new curve will be constructed to connect the two lines on the one track on East Wisconsin Avenue.

Municipal Railway, Seattle, Wash., is reported as about to commence work on a regrading and retracking project on the Westlake Avenue street car lines. The work will cost $85,000 and will include cutting down the roadbed from 1 ft. to 3 ft. from Valley Street to the south end of the Fremont bridge, laying new rails and ties on the double track and temporarily rerouting Fremont bridge cars over Dexter Avenue. Eight crews of 30 men each will be assigned to the work. In addition to this, after a hearing, attended by 300 residents of the Ballard district, the utilities committee of the Council voted to recommend passage of an ordinance appropriating $42,300 for the construction of a double street railway track along Fifteenth Avenue Northwest to 67th Street and a single track line from 67th Street to 85th Street, which is on the corporation line of the city.

Shops and Buildings

Kansas City Public Service Company, Kansas City, Mo., is reported as the purchaser of a triangular shaped lot of approximately one acre, fronting on Summit Street at 41st Street, which will be used as the site of a new carhouse to care of its work cars. The property adjoins that bought by the company last January.

Springfield Traction Company, Springfield, Mo., through A. E. Reynolds, general manager, has announced tentative plans for the erection of a modern garage to take care of the general overhauling and painting of buses. The work will be started on the project just as soon as the plans are drawn. The building is scheduled for completion by early fall. According to the tentative plans the plant will have a capacity of 25 buses and is to be divided into a modern machine shop, heating plant, painting and washing departments.

Worcester Consolidated Street Railway, Worcester, Mass., has obtained a permit to build a carhouse on Grove Street. The new structure will be erected on land that has previously been used for sidetracking and storing the extra cars of the company in the open air.

Trade Notes

Society for Electrical Development, Inc., New York City, announces that new general offices of the society are now in the Graybar Building at 420 Lexington Avenue, adjoining the Grand Central Terminal.

H. B. Chamberlain, who entered the employ of the Tuco Products Corporation, New York City, in 1910 and who in the past few years has been assistant to D. W. Pye, president, has recently been appointed vice-president, with headquarters at 30 Church Street.

Robert T. Kent, until recently superintendent of prison industries for the State of New York, has been appointed to the position of general manager of the Bridgeport Brass Company, Bridgeport, Conn.

J. de N. Macomb has been appointed assistant to the vice-president in charge of railroad sales of the Inland Steel Company, Chicago. Mr. Macomb was graduated from the University of Kansas in 1898 with the degrees of B.S. and M.S. He entered railway service with the Atchison, Topeka & Santa Fe Railway on Aug. 1, 1899, and has been in the employ of that company continuously.

New Advertising Literature

American Brown Boveri Electric Corporation, New York City, announces that circular No. D.M. 10,000 is available for distribution. This sixteen-page illustrated publication describes the A.B.B., Camden, N. J., plant, organization and products, particular emphasis being placed on the company's most recent engineering achievements in industrial fields.

The WELL-KNOWN ACE IN THE HOLE

Not all the aces in the hole are confined to the time honored pastime so peculiar to the United States. We all have them hidden away. It may be a sales argument, a nest egg or a friend—always it is something that has never been known to fail in an emergency.

Traction companies the country over regard PEACOCK STAFFLESS BRAKES as their "ace in the hole" and they play them with unlimited confidence when an emergency calls their hand. Tremendously powerful, easy to operate and unfailingly dependable they are standard equipment on nearly all modern cars. We will be glad to furnish you with estimates.

NATIONAL BRAKE CO., Inc.
890 Ellicott Sq., BUFFALO, N. Y.
Canadian Representatives:
Lyman, Tube & Supply Company, Limited, Montreal, Canada

"PEACOCK"

Reg. U. S. Pat. Off.

Staffless Brakes

Get Ready Now For Hot Tires!

Have you any idea how much heat is generated by the constant bending of tires rolling along under a heavy load?

It depends somewhat on the climate. But we know that after driving some distance at a fair speed through cold dry snow, the tires are hot enough to melt the snow.

Imagine then how hot tires must get in summer driving at high speeds over hot dry roads.

This internal heat has ruined more tires than have punctures or hard wear.

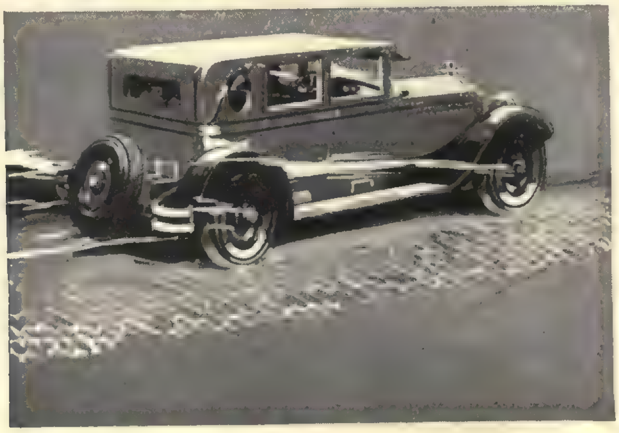
And India with the True-Blue (HEAT-PROOF) inner tube has been the first to overcome this over-curing and premature aging which is constantly shortening tire life.

In laboratory tests and in the hardest possible service on fast bus lines, the savings of this striking discovery have been proven time and again.

Ask to see a True-Blue tube. Feel it and you can pretty nearly see how it makes any tire give better mileage—in any service.

INDIA TRUE BLUE HEAT PROOF INNER TUBE

INDIA TIRE & RUBBER CO., AKRON, OHIO.



India also make red and gray tubes of a quality in keeping with India Balloon and Heavy Service tires.

When its a Fitzjohn

—passengers seek no greater comfort

It's a pleasurable experience to step from the comforts of Pullman travel by rail into the luxury of the roadriding comfort of a Fitzjohn.

And it's a kind of experience which induces passengers to ride and ride again.

To the bus operator this means but one thing—profitable business building.

Then, too, Fitzjohn Bus Bodies render a maximum return on the investment by insuring a minimum of shop service for maintenance. They combine serviceability with finesse in appointment—durability with utmost passenger comfort—strength with attractive, inviting body lines.

Fitzjohn bus bodies—for any type of service—are built complete ready for mounting on any chassis.

Passengers seek no greater comfort than Fitzjohn provides, bus operators need demand no greater asset in good will building than Fitzjohn bodies supply.

Specify Fitzjohn on your next bus order.

FitzJohn
MANUFACTURING COMPANY
Muskegon, Mich.

Twice
DeV

as many!

street railway companies bought YELLOW COACHES last year as purchased any other single make of bus

This did not just happen—

They had the operating experience of past years on which to make comparisons

They found the answer in

YELLOW COACHES

A General Motors Product

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.

YELLOW KNIGHT

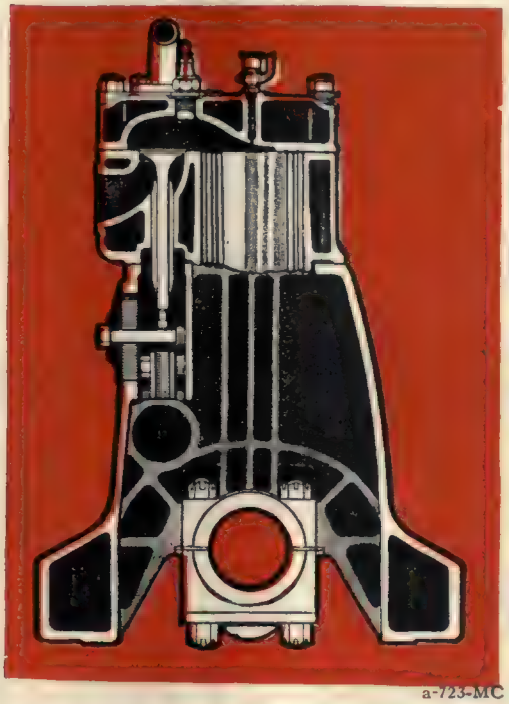
Announcing a KELLY Balloon Tire For Busses

KELLY Bus Balloons will add to your busses the same comfortable riding qualities that Kelly Balloons are giving to private automobiles. Kelly Bus Balloons are built with the same care, the same high quality materials and the same stamina and ruggedness for which all Kelly tires have been famous for over thirty years.

KELLY-SPRINGFIELD TIRE CO.
General Motors Bldg. New York, N. Y.

KELLY SPRINGFIELD BUS BALLOONS

Waukesha Heavy Duty Six Cylinder Construction



a-723-MC

Engines Designed to Stand Up

There is no compromise position. An engine either drives a bus 300,000 miles without trouble or it does not. Often engines are purposely underpowered so that they will stand up but they lack acceleration, speed and fuel economy. No such compromises enter the design of Waukesha "Ricardo" Head six cylinder Bus and Truck engines. Equipped with a "Ricardo" head they give —"valve in the head" power without sacrificing their "Ell" head simplicity—almost touring car mileage with a bus—"pingless" performance.

No ordinary engine design can utilize the advantages of "Ricardo" combustion to the fullest. Much more rigid construction is required — an oversize crankshaft and an extra rigid crankcase. Beside the 3½ inch crankshaft Waukesha Six Cylinder Bus engines have a "Girder" type crankcase—arch ribbed as shown above—reinforced torsionally by tubular longitudinal members on each side and a long vertical slab behind the valve tappets that helps tie the four cross walls together. Such rigidity eliminates objectional vibrations and makes dampeners and auxiliary flywheels unnecessary. Write for Bulletin No. 592 describing this engine more fully.

A-723-LC)

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha **Wisconsin**

Eastern Sales Offices *Eight W. 40th Street* *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

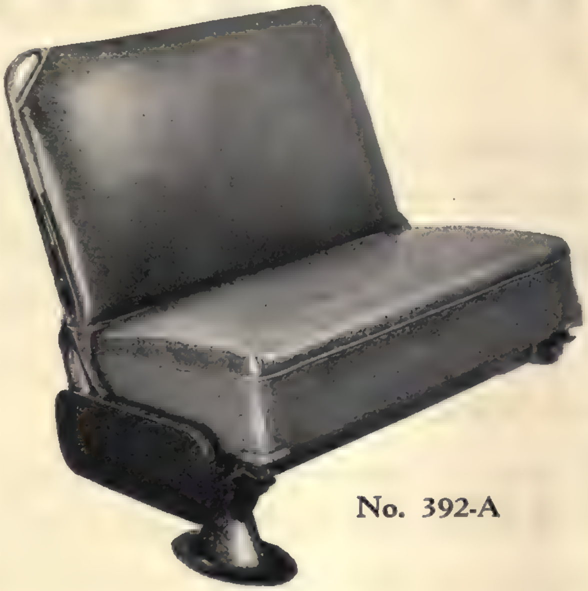
The most thorough proving in every class of bus service has demonstrated that the *Heavy Express Special* is the *one* tire that can carry the load and stand up under express speed

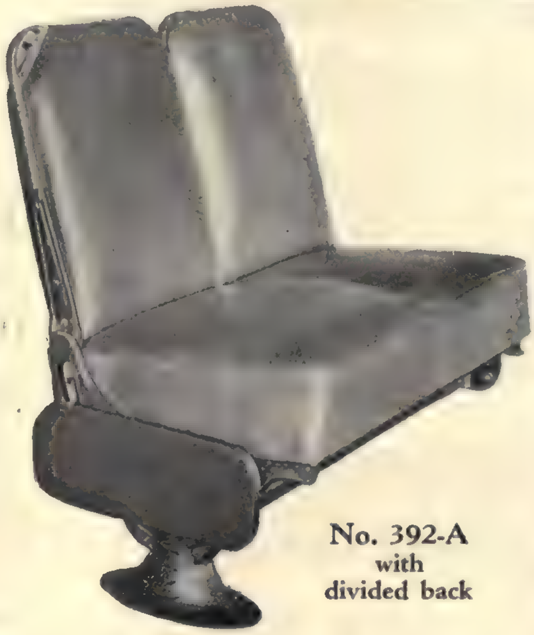
–better buy Generals NOW than *buy and buy*

The
GENERAL
TIRE

—goes a long way to make friends

BUILT IN AKRON, OHIO, BY GENERAL TIRE AND RUBBER CO.


No. 392-A


No. 392-A
with
divided back

New H-K Seat—the result of close cooperation

This type of seat was designed especially for the rehabilitation program of the Market Street Railway, San Francisco. It was the result of close cooperation between the operating company and the experts in seat design of the Hale-Kilburn organization.

The Hale-Kilburn organization will be glad to assist you in working out your remodeling or new car building programs.

No. 392-A (with or without divided back) Low pedestal gives proper and comfortable height and proper pitch. Thick double-face back has deep soft springs and grip handle. Seat cushions are eight inch thick double-deck type, covered with green leather.

Full details of the complete line of H-K Seats on request.

HALE-KILBURN COMPANY

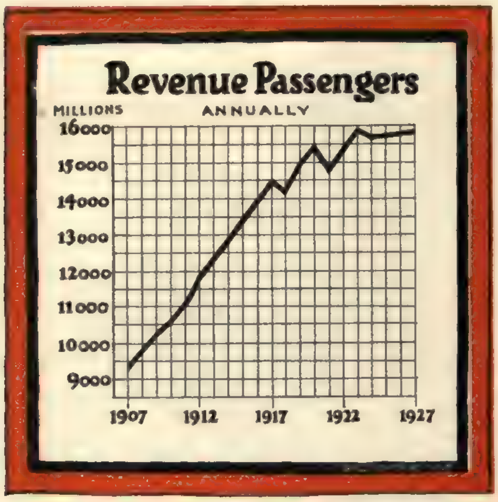
General Offices and Works: **1800 Lehigh Avenue, Philadelphia**

SALES OFFICES

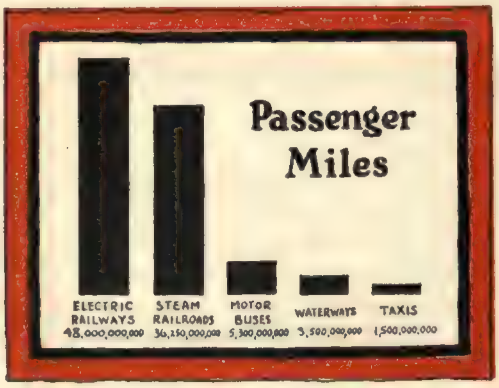
Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco
T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS

So that we shall with the



At an average fare of 7.82 cents per passenger, the annual per capita riding cost of the population of the United States is approximately $12.50.



In 1925 the public patronage of electric railways exceeded the combined total of the passenger miles of all other methods of transportation.

Out of the gloom of disheartening difficulties has dawned a new era in electric railway transportation. Never in the annals of its history have brighter prospects for its future been recorded.

Basic in its service to the public, faithful in its adherence to principle of low cost transportation, the modern light-weight car was destined to come.

But like all revolutionary developments, the industry required the urge of desperate need to adopt it. The good will of the riding population, the cost sheets of the operators, and the continued faith of the investing public—all demand improved equipment.

St. Louis Car Co.

Quality Cars

keep faith
public

Obsolete cars stamp a property as "behind the times". They are a badge of failure and a physical handicap to efficient operation. They must be scrapped. Self preservation and common-sense economics demand that the industry keep faith with the public.

From 1890 to 1926, the number of employees quadrupled.

There is nothing fundamentally unsound about electric railway transportation. Statistics belie the impression that electric railways are "on the way out."

But modernization is needed to repopularize them in the public mind.

Operating revenues have increased from $90,616,211 in 1890 to $941,000,000 in 1926—a ten-fold increase.

What others have done, you, too, can accomplish. And with the assistance of Quality Shops, you can profit by keeping faith with those whose support is more vital to you than the entire physical value of your property.

St. Louis Car Co.

Quality Cars

Photo by Times Wide World

You can't "drown" Valspar!

This fact was proved recently in Calcutta when the Valsparred buses had to plow through flooded streets for hours at a time. But each night when the water and mud were wiped away, the Valspar finish came up smiling. *You can't drown Valspar.*

Of course no bus or street car has to face such conditions in this country. But changing weather conditions—rain, sun, ice and snow—are often even more effective in destroying the finish of a car.

Keep your cars working

Valentine & Company offer you finishes and finishing systems designed to keep your cars on the road. These systems—oil, japan and lacquer—may be adapted to meet the individual requirements of each individual case. Each is the best system of its type.

VALENTINE & COMPANY
NEW YORK CHICAGO BOSTON

NITRO-VALSPAR

The Valentine Lacquer Finish

Faster, *Safer*, Service

Duplex Air and Magnetic Brakes reduce stopping distance 22.5 to 46%!

Up-to-date people figure their time in minutes. And they are *most* jealous of those minutes they spend in transit.

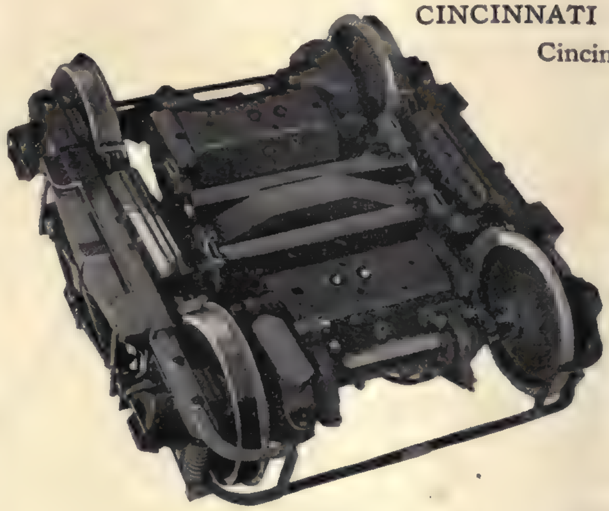
Hence the need for speed, pick-up, and equally rapid deceleration, in electric railway cars of all types. A need that has been well met through the application of BALANCED DESIGN to modern car building, and the first practical application of the Duplex Air and Magnetic brake.

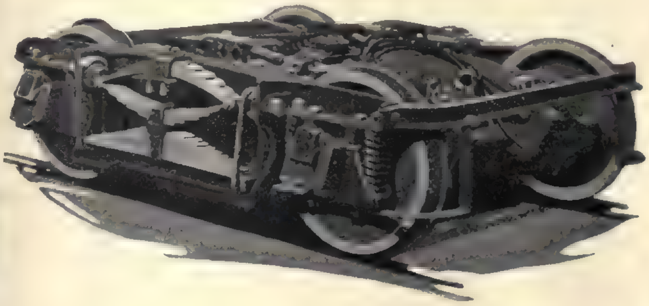
The merits of this system have been amply proved in exhaustive trials conducted by independent operators, and in service on the Buffalo & Erie Railroad and the Kentucky Traction & Terminal Company's lines in Lexington.

Operating through a standard M28 valve the Duplex Brake has demonstrated its ability to function efficiently at all speeds and *without regard to wet or greasy track conditions*, reducing average emergency stopping distance 22.5 to 46%, and decelerating on test, a 19-ton car from 60 m.p.h. to stop in 800 feet.

We'll gladly discuss the details and application of this revolutionary improvement with any interested electric railway executive.

CINCINNATI CAR COMPANY
Cincinnati, Ohio





CINCINNATI
New
CARS

A step ahead of the modern trend

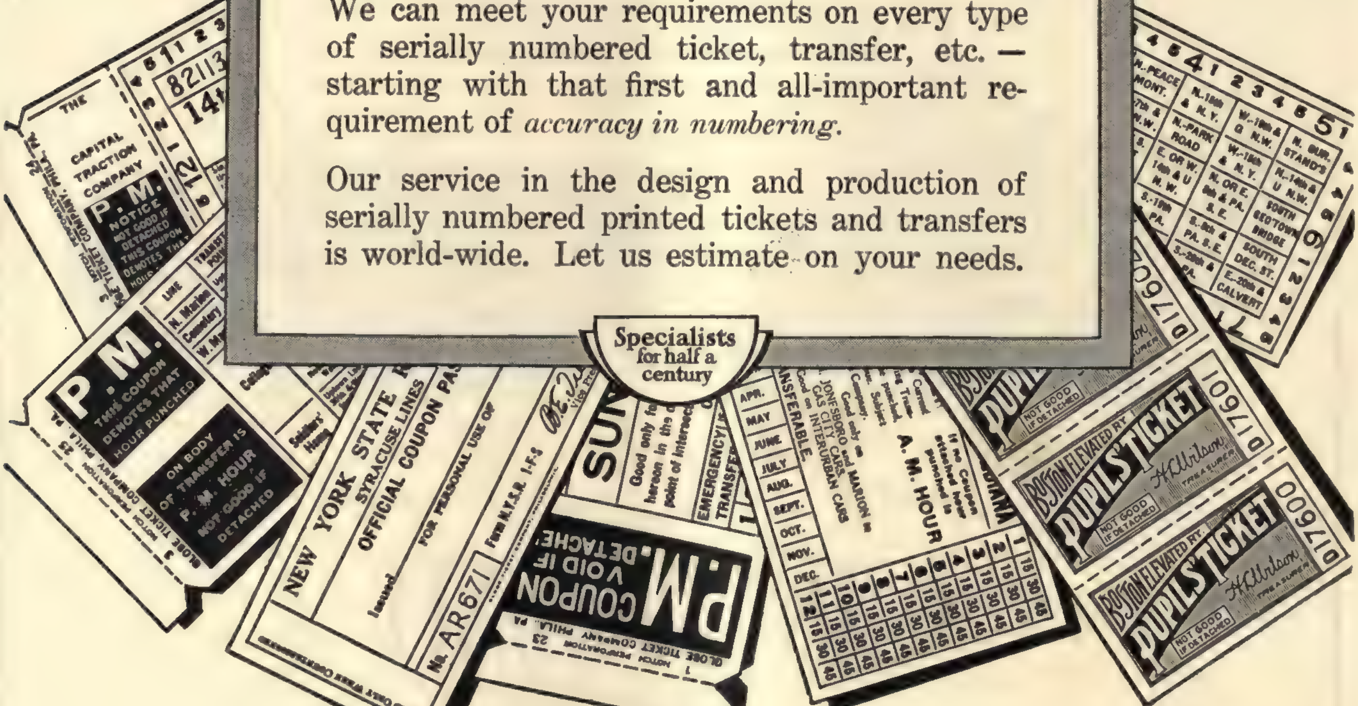
Who originated the P.M. coupon transfer

?

GLOBE DID. We say this, not at all in a boastful spirit, but as an evidence of our active part in the development of safer, more efficient methods of fare collection. The P. M. Coupon Transfer saves thousands of dollars every day for transportation companies everywhere.

We can meet your requirements on every type of serially numbered ticket, transfer, etc.—starting with that first and all-important requirement of *accuracy in numbering.*

Our service in the design and production of serially numbered printed tickets and transfers is world-wide. Let us estimate on your needs.

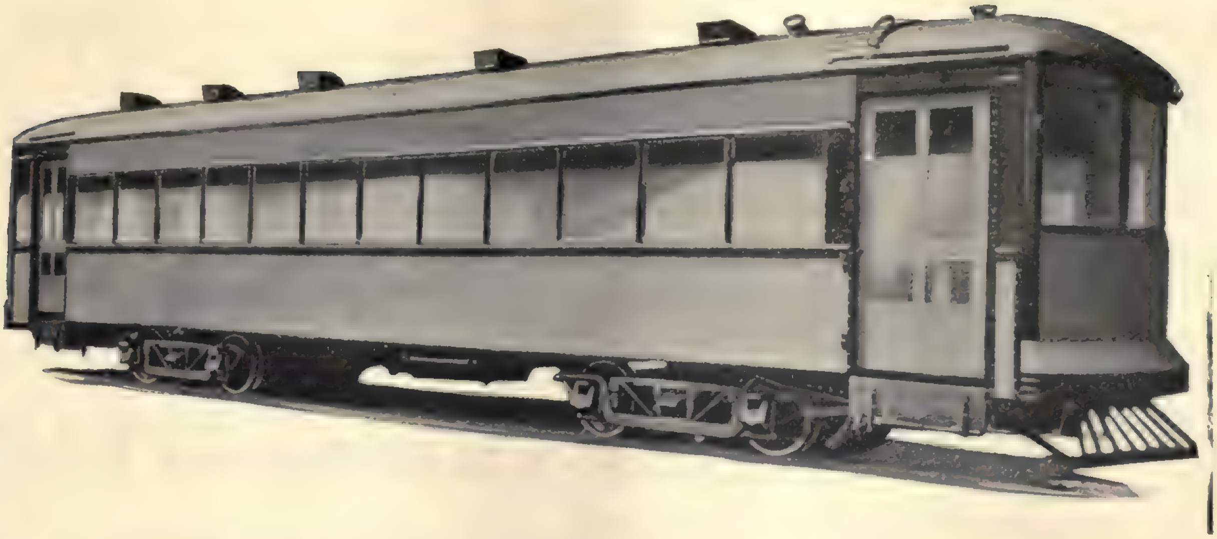

THE CAPITAL TRACTION COMPANY
P.M. NOTICE NOT GOOD IF DETACHED THIS COUPON DENOTES THAT HOUR
P.M. THIS COUPON DENOTES THAT HOUR PUNCHED
ON BODY OF TRANSFER IS P. M. HOUR NOT GOOD IF DETACHED
NEW YORK STATE R
SYRACUSE LINES
OFFICIAL COUPON PA
No. AR671
P.M. COUPON VOID IF DETACHED
EMERGENCY TRANSF
A. M. HOUR
BOSTON ELEVATED RY. PUPILS' TICKET
NOT GOOD IF DETACHED
BOSTON ELEVATED RY. PUPILS' TICKET
NOT GOOD IF DETACHED

Specialists for half a century

Globe
TICKET COMPANY

112 North Twelfth Street
PHILADELPHIA

NEW YORK BALTIMORE CLEVELAND LOS ANGELES



The Modern Car
is a Business Builder

WHAT could be more effective in drawing increased patronage to the electric railway than the modern car? Its convenience has never been equalled. Now it is more pleasing in appearance, more comfortable to ride in, and quieter than ever before.

With all the modern features, the street car is becoming the preferred method of transportation

CUMMINGS CAR AND COACH COMPANY
Successors to McGuire-Cummings Mfg. Co.
111 W. Monroe Street, Chicago, Ill.

How a Manufacturer Removed "OR EQUAL" from Specifications Embodying Standard Products

Exit Order Taking—ENTER

THROUGH years of outstanding service and effective Industrial Advertising, countless products are so thoroughly established that buyers will have no substitute. But even in this day too many products used by Industry are still on a John Doe "or equal" basis.

In such a case it is hard for any one company to get a real preference. No particular make is specified; extra quality isn't respected; price cutting saps profits; repeat orders are elusive and volume of business uncertain; buyers do not regard salesmen seriously enough as engineering advisors.

Handicapped to the brink of failure by just such a "nobody cares" situation, a manufacturer of a product in general use in the electrical industry determined to make buyers know that his salesmen were qualified to render helpful engineering service and to establish definite preference for his product.

This difficult task was begun eleven years ago and another "tough nut" in industrial marketing has been cracked by Industrial Advertising.

Cracking the Shell of Disinterest

Regularly appearing in McGraw-Hill Publications, Industrial Advertising presented this manufacturer's story in terms so interesting that his copy became a feature looked forward to by Industrial Buyers. Woven into the novel presentation of each message was logic so sound that it gradually wrought a complete change in buying habits.

The interest stimulated put the advertiser's representatives on an entirely new basis. Friendly arguments aroused by advertising paved the way for the much desired engineering service relationship. Gradually recognition of the product became so general that its name is now first in mind with the majority of Industrial Buyers.

Holding the Advantage

After the transition was achieved this manufacturer took no chances of losing the ground he had gained. Industrial Advertising that marked the beginning of his success has now become a vital factor in perpetuating the engineering service relationship between his sales staff and industrial buyers and it is keeping his product out of the "or equal" class.

Although the McGraw-Hill Four Principles of Industrial Marketing were not codified when this manufacturer started out, he actually followed their logic. His Industrial Advertising was nothing more or less than an intelligent application of these principles:

1. Determination of worthwhile markets.
2. Analysis of their buying habits.
3. Determination of direct channels of approach.
4. Study of effective sales appeals.

These Four Principles chart a clear course for the producer who is hampered by inadequate industrial recognition.

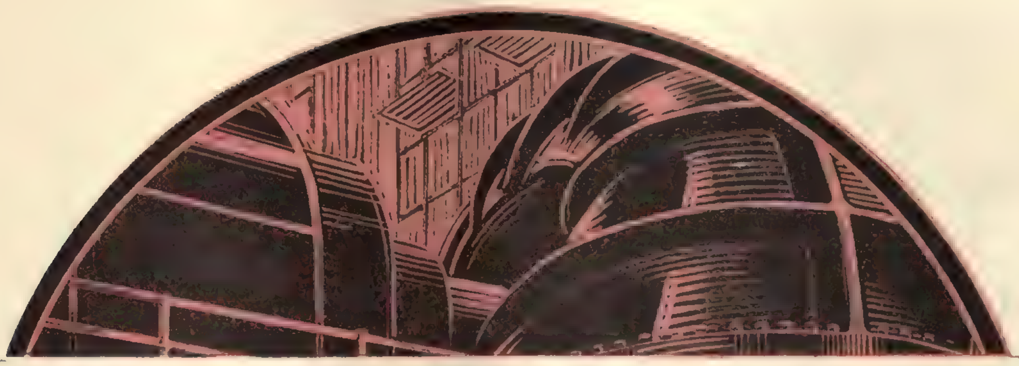
Any manufacturer or his advertising agency who wishes to study the possibilities of applying the Four Principles to his particular industrial marketing problem will find valuable assistance in the newly published book, "Industrial Marketing at Work," which the nearest McGraw-Hill office will deliver on request.

MCGRAW-HILL PUBLISHING COMPANY, INC.

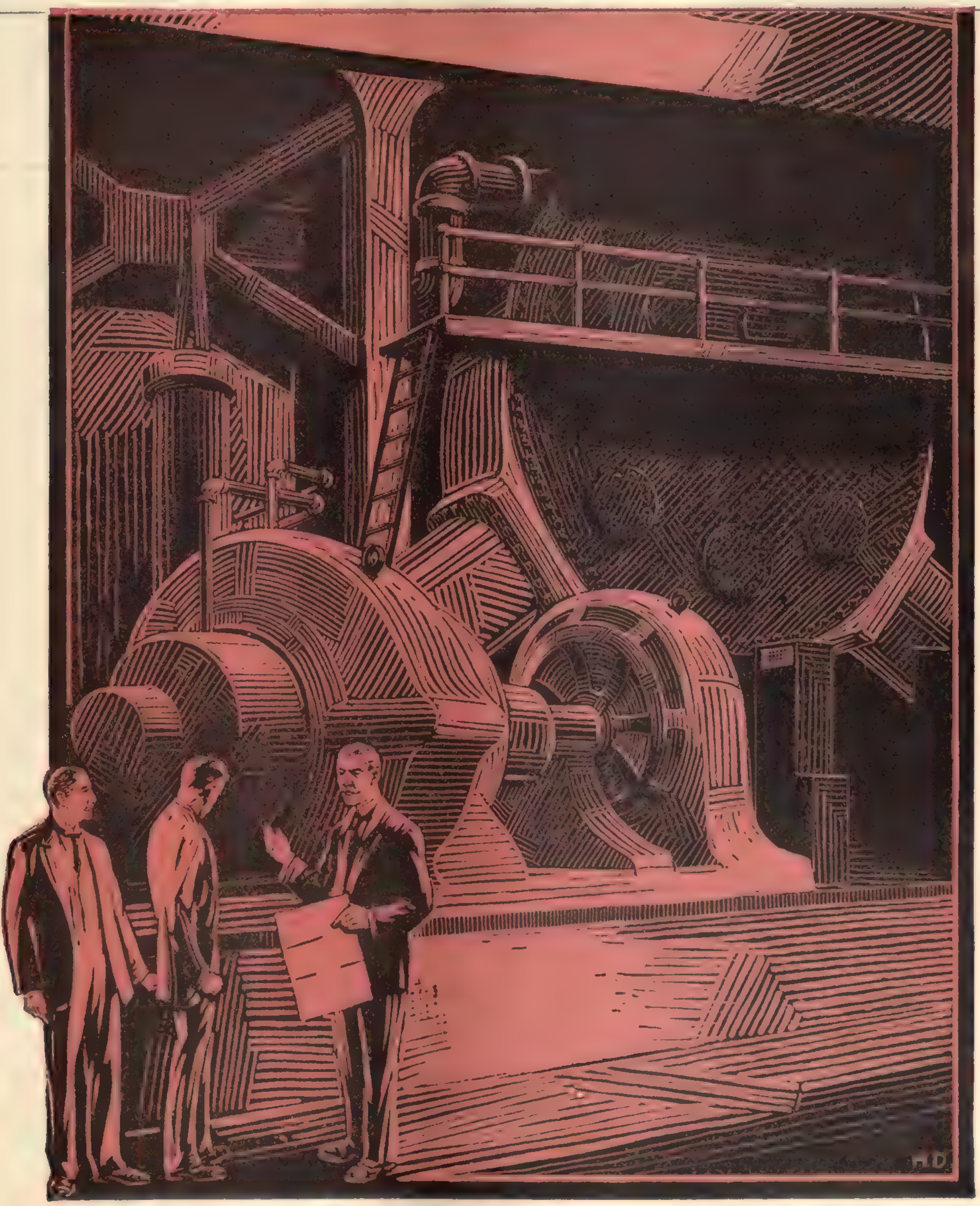
McGRAW-HILL
Publications

NEW YORK
CHICAGO
CLEVELAND
PHILADELPHIA

ST. LOUIS
SAN FRANCISCO
LONDON



ENGINEERING SALESMANSHIP



Beauty is SKIN DEEP!

This is the third of a series of "SKIN DEEP" advertisements on leather upholstery for electric railway cars and buses. The fourth will appear in an early issue.

The beauty of upholstery when Cleveland Tanning Co. leather is used *is* skin deep, it never wears out—through long years of service. And it has such a clean appeal, offers so comfortable a ride, that passengers prefer leather seats to any other.

Cleveland Tanning Co. leather used in upholstering the seats in your cars or buses will add the final touch of beauty and modernity. It will outwear any other form of seat covering and actually costs less per mile in the long run, with maintenance costs at the minimum.

Supplied as complete hides, or cut to any pattern; five famous grades: Hyaline Grains, Alpha Grains, Hand Buffs, Machine Buffs and Special Machine Buffs. Color and finish according to your specifications. We will be pleased to send you samples.

A new leather—
LUXOTAN

A Luxury Leather which we guarantee to be produced from the grain side of strictly No. 1 Packer Steer Hides. It is not buffed. It is Aniline Dyed for penetration of color and coated with only a thin film of pigment to level the dyed color.

It will not fade. It is waterproof and adapted to any class of upholstery where a Quality Article is required.

NOTHING TAKES THE PLACE OF LEATHER

HYALINE

The Cleveland Tanning Co.
Dennison Ave. and Jennings Rd., Cleveland, O.

Western Representatives:
Midgley & Borrowdale
McCormick Bldg., Chicago

Selling Agents:
Automotive Materials Corp.,
General Motors Bldg., Detroit, Mich.

Eastern Representatives:
Sisson Supply Co.,
1845 Grand Central Terminal, New York

Price *IS* Important

Low Initial Cost –

GRAHAM BROTHERS

SOLD BY DODGE BROTHERS

Low Operating Cost

Graham Brothers Motor Coaches, of Medium Capacity and Unquestioned Performance Ability, Require a Minimum of Capital Investment

Price IS important.

And the price of Graham Brothers Motor Coaches is surprisingly low.

Replacement reserves can be set up on a much shorter basis with Graham Brothers Coaches, without excessive charge through operating expense, than with more costly equipment. Yet this short period does not measure physical depreciation—it is insurance against obsolescence.

Only Graham Brothers great volume production makes possible such high quality motor coaches at such low prices.

Operating and maintenance costs are correspondingly low, too.

$3750	$3815	$3995
12-Passenger Parlor Coach, Complete	**21-Passenger Street Car Type, Complete**	**16-Passenger Parlor Coach, Complete**

Prices f. o. b. Detroit

MOTOR COACHES

DEALERS EVERYWHERE

Product of a Great Institution

Graham Brothers Motor Coaches are the product of a great institution—sound, stable and experienced.

They are built complete, bodies as well as chassis, by Graham Brothers, a division of Dodge Brothers, Inc.

They are sold and serviced by Dodge Brothers Dealers everywhere.

When you purchase a Graham Brothers Motor Coach you have the assurance of Graham Brothers for the excellence of the product. And your dealings are with your local Dodge Brothers Dealer who will be right there where you bought your equipment this year, next year—whenever you need him.

GRAHAM BROTHERS

EVANSVILLE – DETROIT – STOCKTON
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONTARIO

International Harvester Coach equipped with chairs designed and built by S. Karpen & Bros.

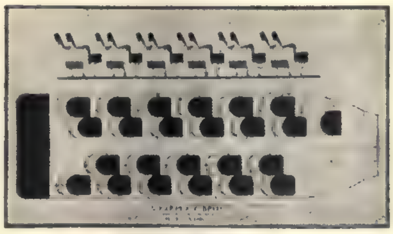
Karpen chairs equip the most comfortable motor coaches

Comfort is the point of greatest distinction in modern motor coach construction. The traveling public, accustomed to the luxury of private motors, creates keen competition among operators by a demand for equal comfort in public coaches.

For nearly half a century Karpen has been designing and building high grade seating equipment for homes and public buildings; for steamships and railroad club and observation cars. And now this experience makes it a leader in the manufacture of chairs of various types for motor coach equipment.

All Karpen coach chairs are built of indestructible fibre, with steel reinforcement in every upright stake. Climate and temperature have no effect on it. The Karpen "Staggard" seating method is the only arrangement which gives the comfort and privacy so much appreciated by passengers, without reducing the seating capacity.

All buyers of transportation seating equipment are cordially invited to consult our experts. Address Transportation Seating Department, General offices, Chicago.



(Patents Pending)

Karpen
FURNITURE

KARPEN Guaranteed Construction FURNITURE

S. KARPEN & BROS.
General Offices, 636-678 West 22nd Street
CHICAGO

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37th Street and Broadway

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180 New Montgomery Street

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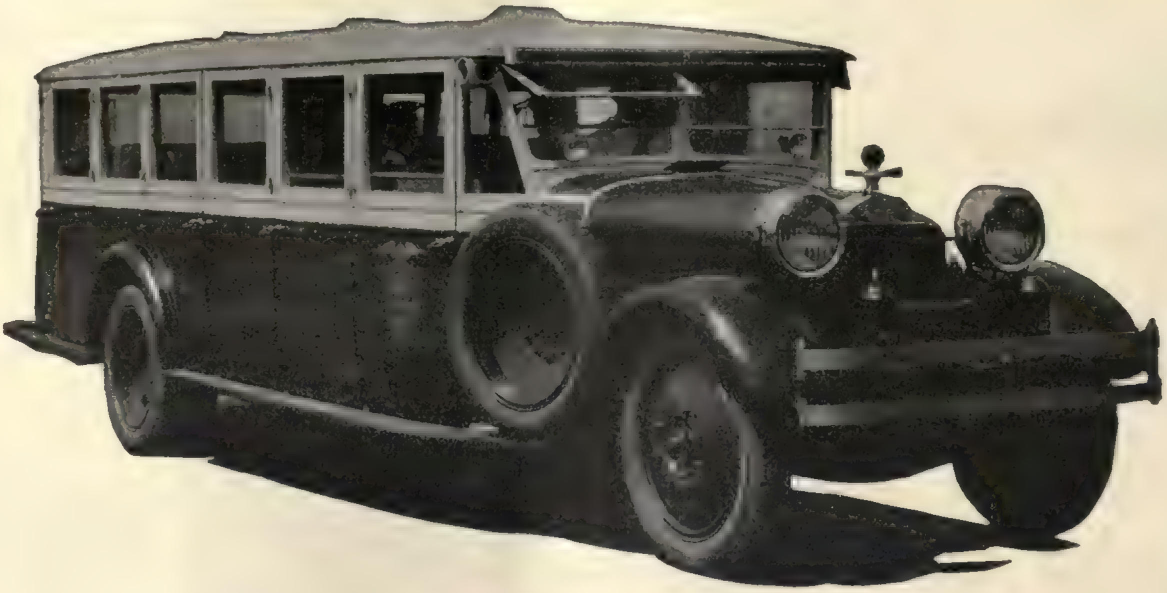


TEXACO BUS OILS

are used Exclusively
on all the Buses of

The Penn-Ohio System

—and the Penn-Ohio System, you will remember, received the Charles A. Coffin award "for Distinguished Contribution to the Development of Transportation for the convenience of the Public and the benefit of the industry."

What TEXACO is doing in the way of cutting costs of operation and securing improved engine performance on the Buses of this and other important companies throughout the country, can be duplicated on the Buses of your company.

Do not hesitate to communicate with us. We shall be glad to co-operate with you to the fullest extent.

THE TEXAS COMPANY
Texaco Petroleum Products
Dept. E-52 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

"STANDARD" STEEL PARTS

Vital Items of Equipment

A car that is equipped with "Standard" Steel Wheels, Springs, Axles and Armature Shafts is serving the public with the maximum of safety, speed and comfort and paying the operator a just return upon his wisdom in selecting "Standard" quality, for such vital items of equipment.

STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

BRANCH OFFICES:

CHICAGO
ST. LOUIS
NEW YORK
HOUSTON, TEXAS
PORTLAND ORE.
RICHMOND, VA.
SAN FRANCISCO
ST. PAUL, MINN.
PITTSBURG, PA.

WORKS: BURNHAM, PA.

The Turn of a Wheel

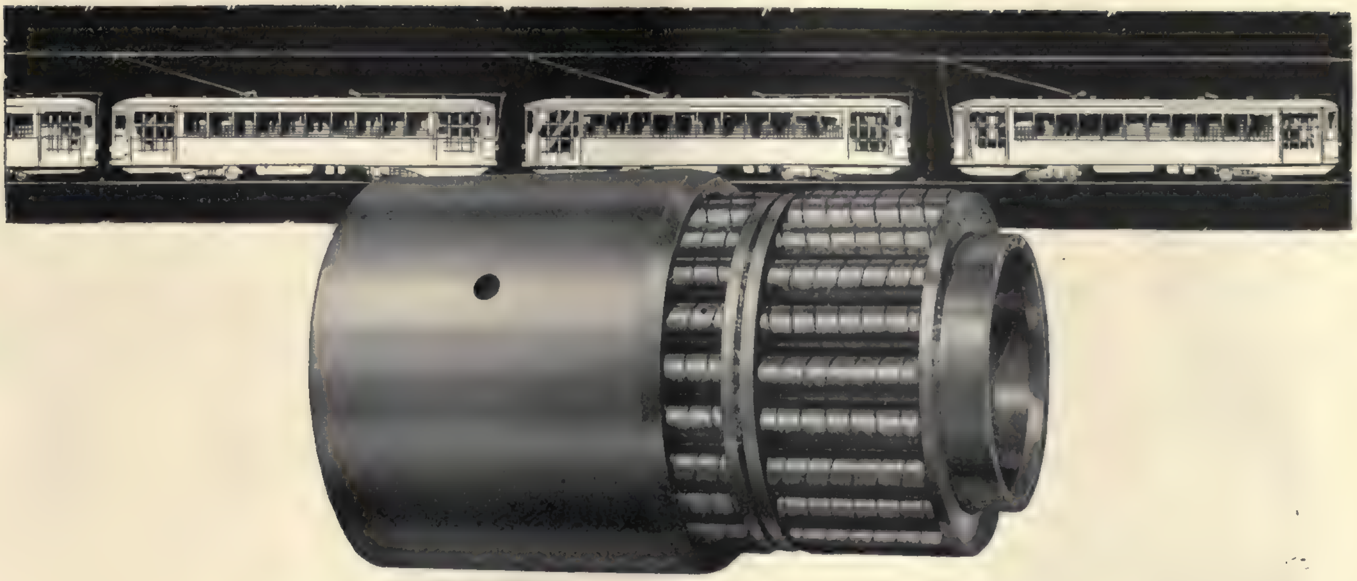
Every time a wheel turns or a piece of machinery moves in your plant, friction takes its toll: some microscopic portion of a bearing is torn off. The toll taken by a single revolution of a wheel is infinitesimally small, but when it is multiplied by weeks and months of operation, it assumes much larger proportions. Eventually it means repair and replacement costs — just so much money taken away from the profits of the plant.

Friction can never be done away with entirely, but it **can** be kept at the minimum by the use of the correct grades of oils and greases. To reduce friction to the minimum, the lubricants must be of exactly the right body to meet the requirements of the particular bearing on which they are used. If they are too light, the protective film between the bearing and the shaft can not be maintained: if they are too heavy, the internal friction of the lubricant itself imposes a drag on the machinery.

Standard Oil and Greases

are made in many grades to suit the requirements of all machinery in use in the industrial world today. Our agent in your city is thoroughly familiar with modern industrial machinery, and will recommend the grade that will give the best results in your plant.

STANDARD OIL COMPANY
(Indiana)
910 South Michigan Avenue Chicago, Illinois



Hyatts
are easier on the car
—and its passengers

Jerky starts and the power-wasting drag of friction bearings when running are banished forever with the use of Hyatt Roller Bearings in car journals.

Smooth starts, rapid pickups and quick, cushioned operation are Hyatt contributions to greater car comfort and punctual railway service.

Hyatt bearings are practically frictionless. The sturdy rollers rotate with the wheels in a natural, easy motion—reducing friction and wear, and cutting power costs appreciably.

The only attention Hyatts require is three or four lubrications a year. Bearing repairs and replacements are unheard of. Hyatts keep the cars busy earning profits instead of wasting time in repair shops.

The advantages and economies of Hyatt Roller Bearings are worth investigating. Every A. E. R. A. requirement for standard equipment or replacement is met.

HYATT ROLLER BEARING COMPANY
NEWARK, N. J.

HYATT
QUIET ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

The Canadian Fairbanks-Morse Company, Ltd., Distributors of Hyatt Railway Bearings in Canada

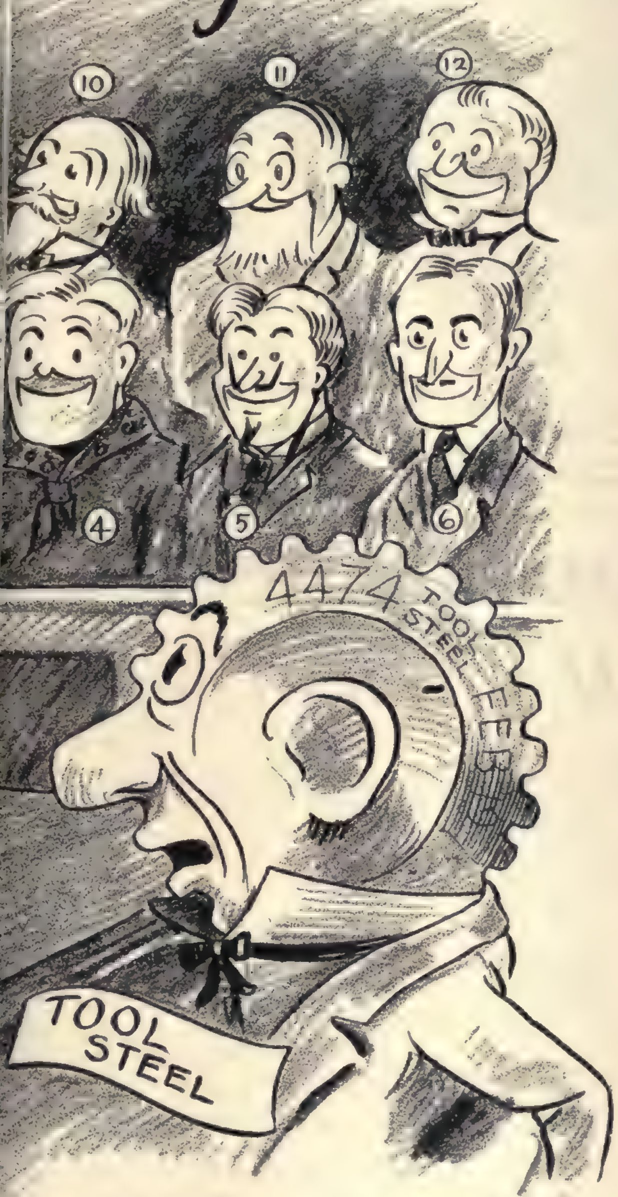
The Jury in the

and gives Mr. "Too
work an

TOOL-
GEARS

The Standard of Quality

renders a verdict of "Guilty"
case of Mr. "Tool Steel" Gear



The Judge Hears the
Report of the Jury—

1. A.E.R.A. Equipment Committee—82% are "Tool Steel" gear users.
2. A.E.R.A. Question Box finds "Tool Steel" best.
3. Electric Traction Trophy Winner used "Tool Steel" gears in winning car.
4. Western Canada is unanimous in favor of "Tool Steel" gears.
5. Europe says no other American manufacturer touches "Tool Steel."
6. South America is almosts exclusively "Tool Steel."
7. Australia is buying "Tool Steel" heavily for new British made motors.
8. Ohio, the home state is practically unanimous in selecting "Tool Steel."
9. C.E.R.A. Master Mechanic Officers are 82% "Tool Steel" users.
10. Southern Equipment Men praise "Tool Steel" highly.
11. Holland specifies "Tool Steel" gears when buying German motors.
12. A.E.R.A. Equipment Committee Questionnaire answers were from Companies, 88% of whom used "Tool Steel" gears.

The Tool Steel Gear & Pinion Company
Cincinnati, Ohio

Steel" Gear a life sentence of hard
continuous service.

STEEL QUALITY
AND PINIONS

The Lubrication Engineer

will tell you that—

The illustration shows a De Laval Crankcase Oil Reclaiming Outfit in use at the garage of the T. Eaton Co., Ltd., department store, Winnipeg, Man., Canada.

—Oil costs and lubricating costs are entirely different matters. Lubricating cost is the amount you actually pay for oil *plus* what you spend for repairs made necessary by inefficient lubrication.

—And it is generally conceded that at least 75% of all automotive repairs are the direct result of poor lubrication.

Most lubrication engineers will tell you this: fill your crankcases with the best oil you can buy regardless of its cost—drain frequently—thoroughly purify the drainings and use again like new oil. Lubricating costs will drop 50, 60—yes, even as much as 80 per cent.

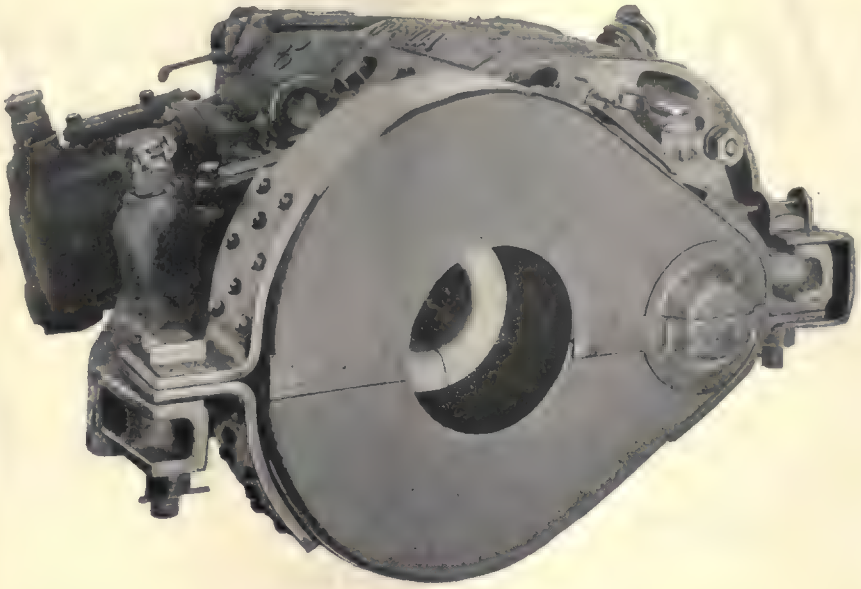
The generous use of good oil—always an economy—becomes even more so when a De Laval Crankcase Oil Reclaiming Outfit enables you to keep the same oil in service indefinitely. This outfit renews old oil at a fraction of its cost—removes carbon and other impurities—restores its viscosity—its ability to lubricate and resist heat—makes it still more economical to use the best oil and change every few hundred miles.

If you operate 15 or more vehicles it will pay you to write for further information. *Ask for Bulletin 108-R.*

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York · 600 Jackson Blvd., Chicago
DE LAVAL PACIFIC COMPANY, San Francisco
ALFA-LAVAL CO., Ltd., 34 Grosvenor Road, London, S. W. 1

DE LAVAL

Crankcase Oil Reclaiming Outfit
Car Axle Oil Reclaiming Equipment-Transformer Oil Purifiers



W. H. 510-A Motor

Gear Cases that reduce "Pull-Ins"

Gear troubles keep cars in shops eating up profits when they should be out in scheduled service. It's a long step toward economic operation when gears are protected with Chillingworth Drawn Steel Seamless Gear Cases.

Their one-piece construction, with *overlapping* joint between the two halves, absolutely prevents the entry of dust or the escape of grease. The extra tough elastic deep drawing steel, without parts to loosen and without seams to open up,—*give the utmost protection to gears.*

Light weight combined with great strength and toughness make for low maintenance.

Ask any of the nation-wide users of Chillingworth Gear Cases about their superior merits.

Chillingworth Manufacturing Co.

Jersey City, N. J.

Representatives:

J. W. Gerke
New York

Railway & Power Engineering Co.
Canada

Tool Steel Gearing & Equipment Corp.
England

No loss in strength in creosoted pine poles 27 years old

"CREOSOTED pine maintains its strength over a long period. Tests on creosoted pine poles 27 years old showed no decrease. All evidence indicates that as long as the wood is preserved against decay the original strength is undiminished."

That is the conclusion of a superintendent of transmission and distribution in a paper read before a convention of the N.E.L.A.

This maintained strength is a characteristic of Amcreco poles which deserves careful consideration in fixing the factor of safety of a pole line. Unbiased comparisons of Amcreco poles and other species should include proper allowance for this factor. Are you taking full advantage of the strength and long life offered by these poles?

AMERICAN CREOSOTING COMPANY
INCORPORATED

COLONIAL CREOSOTING COMPANY
INCORPORATED

AMCRECO
LOWRY PROCESS
CREOSOTED WOOD

GEORGIA CREOSOTING COMPANY
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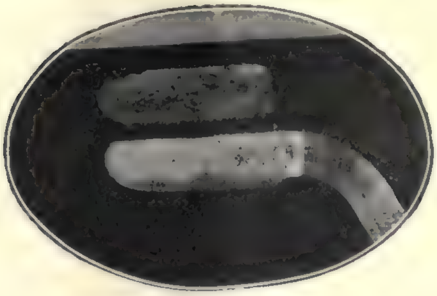


It Won't Break at the Weld

PERMANENT high conductivity, fast application and low installation cost are required of any type of rail bond.

Erico brazed bonds and bonding outfits meet these requirements.

The Erico brazed bond, when applied, becomes an integral part of the steel rail. Our guarantee—brazed bonds cannot be removed from the rail except by actual mutilation—is unquestioned. The full measure of conductivity obtained when using Erico brazed bonds is permanent.

Only a few seconds required to apply each bond terminal. The heat of application is so low that the operator can view the operation with the naked eye. After the welding furnace is properly set up on the bond, the application is practically automatic—you can't help but have better rail bonding.

Further details about brazed bonding are found in circulars 12 and 17. Send for them.

Type SR Portable Bonding Outfit

The Electric Railway Improvement Co.

2070 East 61st Place

Cleveland, Ohio

Above—New station of the Southern Pacific Railway, Redlands, Calif.

At left—Concrete train shed, Southern Pacific Railway, Sacramento, Calif.

For Modern Railway Structures

MANY of America's progressive railroads, among them the Southern Pacific Railway Company, are finding in portland cement concrete the ideal building material for stations, train sheds, signal towers, bridges and other structures which are duplicated at various locations.

Precast concrete units, which are extensively used in such installations, are manufactured according to factory principles of production and quality control, thus combining economy of cost with full flexibility of arrangement and size.

Rail structures of portland cement concrete are firesafe, and successfully withstand the attacks of climate and constant use.

PORTLAND CEMENT *Association*

Concrete for Permanence CHICAGO

International Creosoted Pine Poles have greatest uniform strength, because the average strength of Southern Yellow Pine is not only 44% greater than the nearest other pole specie, but the variation in strength of the individual poles from the average is also much less.

This combination of greatest average strength plus most uniform strength, makes the Creosoted Pine Pole the most suitable for line construction. These poles give greatest protection against service interruptions during ice and wind storms.

Illustration shows International Creosoted Pine Poles in service on the Union Pacific

International Creosoting & Construction Co.
General Office—Galveston, Texas
Texarkana—Beaumont—Galveston

International
Creosoted Yellow Pine Poles

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

Barron G. Collier
INCORPORATED
CANDLER BLDG. NEW YORK

DREW Equipment for Electric Railways

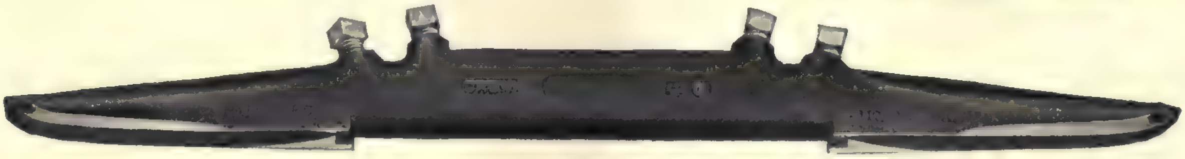
Drew Overhead Line Material—always latest approved type—built for long satisfactory service—easy and quick to install—economical to buy. Delivery is prompt. Drew Products assure better service with a saving.

Drew Floating Bell Hanger (Left)

Positively eliminates loose ears because of tight lock between hanger and ear. Prevents rusted and worn threads. Assures better service with a saving.

No. 7520 Porcelain Strain Clevis (Right)

Used in large quantities by leading railway companies for great variety of overhead work. Practical. Convenient. Ample insulation. Strong enough for any overhead work.

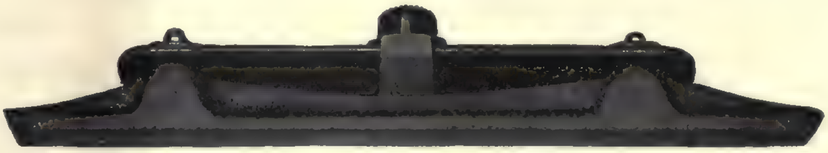


Type "L" (Heavyweight) or Type "R" (Lightweight) Splicing Ear or Splicer (Above)

Actually becomes a part of the wire in use, giving smooth under-run for the life of the wire. V shaped approach carries the current collector on and off with minimum jar or vibration. Prevents notching or rough spots.

Drew Safety Mirror (Below)

Greatly reduces boarding and alighting accidents. Quickly adjustable for different types of cars. Gives motorman clear view of steps. Cuts running time because motorman can always be ready for instant starting.

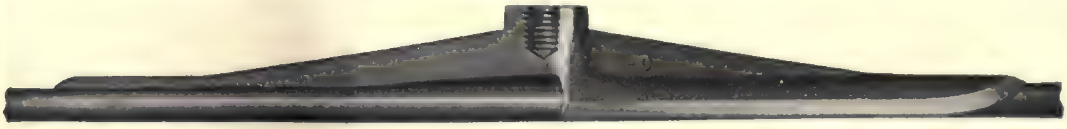


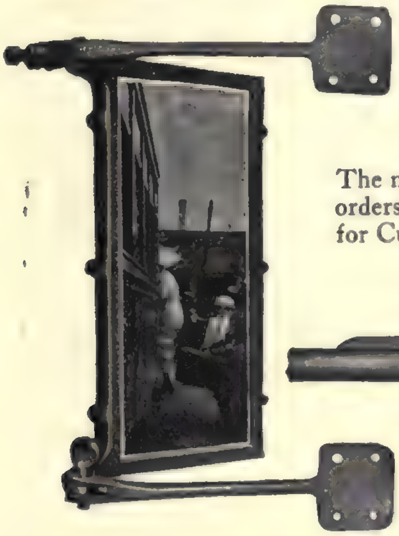
Drew Spring Ear (Above)

Does away with destructive wear on trolley. Eliminates pounding on trolley wheel, base, hangers, trough structure. Insures smoother and quieter car operation.

Drew Cushion Ear (Below)

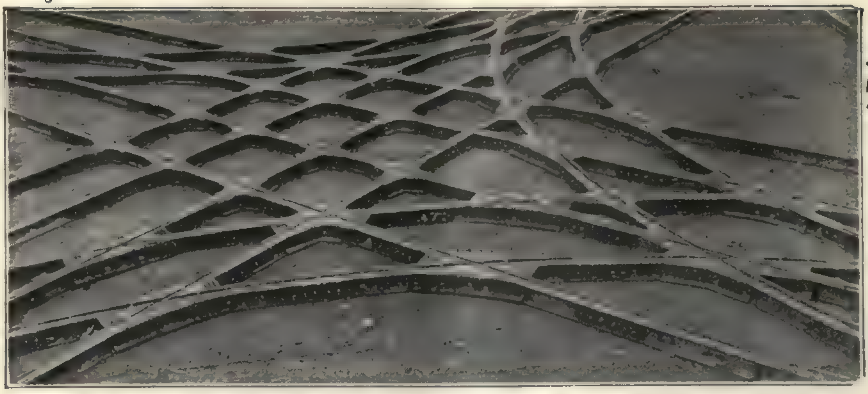
The merit of this ear is best recognized from its performance in actual service. Repeat orders over a period of years from large and small properties prove the claims we make for Cushion Ears. Longer life and complete protection for the trolley wire.





The Drew Electric & Mfg. Co.

Cleveland, Ohio



THE STANDARD IN TRACKWORK FOR NEARLY FIFTY YEARS

BUDA

ESTABLISHED
1881

Send us your Inquiries

THE BUDA CO. HARVEY, ILL.

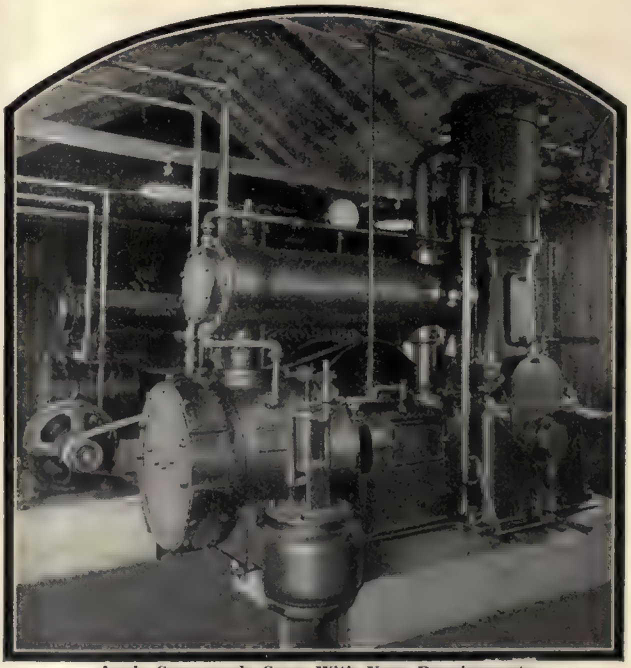
Air Power for the Shop

Air Power in your shop becomes more and more important with every air tool added to speed production; and more and more of your labor is staked on the dependability of your air compressor.

That is probably the biggest reason why so many shops like your own turn to Sullivan Angle Compound Compressors. But Angle Compounds save in other ways, too. When you install an Angle Compound, your savings in installation cost will run into hundreds, perhaps thousands of dollars. This is due to compact, balanced angle design, and to consequent "vibrationless" operation.

Multi-step load control gives you lowest possible power consumption at any partial load. "Wafer" valves, positive automatic force-feed lubrication and three-pass counter-flow copper intercoolers are other features which help to give you dependable, economical air power. Angle Compounds are available in capacities from 400 to 3700 cu. ft., for belt drive, or for direct connection to electric motor, or oil engine.

Write for Catalog 3283-A.



Angle Compounds Grow With Your Requirements

Above is shown the Sullivan Twin Angle Compound Compressor at work in the Saco-Lowell Shops, Biddeford, Maine. In 1916 these shops put in a 500-ft. belt driven angle compound. In 1920 they put in an 800-ft. belt-driven angle compound. Then they changed these machines to synchronous motor drive ready to be halves of twin Angle compounds. Recently they installed another 800-ft. Angle Compound, and made a twin Angle Compound of the two similar compressors, driving both direct from one synchronous motor between them. When another increase in air power is needed, another 500-ft. Angle Compound will probably be added to combine with the first 500-ft. machine, to make a twin unit.

SULLIVAN
TRADE MARK
MACHINERY COMPANY
150 S. Michigan Ave. Chicago

Dayton Tie
Records
Have Never
Been Equalled
The Dayton
Mechanical Tie Co.,
DAYTON, OHIO

Dayton Tie Records Have Never Been Equalled

ACTUAL cold, black and white records of performance hung up by Dayton Mechanical Ties have never been equalled in the Electric Railway Industry.

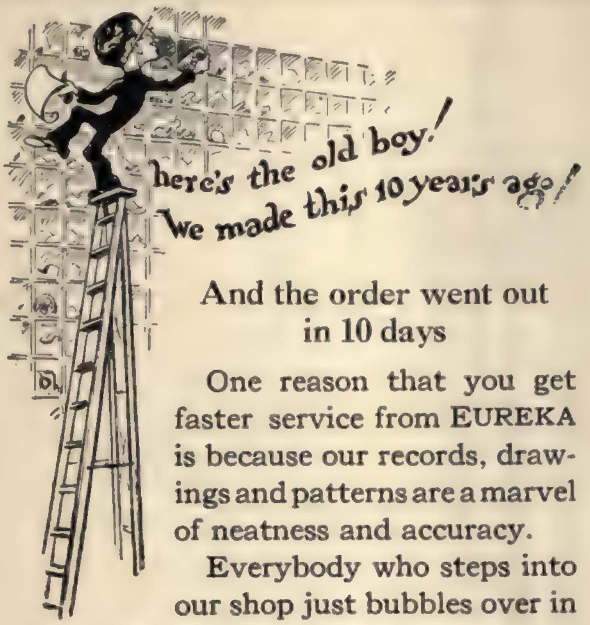
Not only long life—since their inception, no track laid on Dayton Ties has ever worn out—but also permanent smoothness—wiping out of track maintenance costs.

The vibration absorbing feature inherent in Dayton Ties preserves the concrete. Concrete failure becomes a thing of the past when you install Daytons.

Heavy, frequent traffic, or light occasional—all one to Dayton Ties.

They have conquered what many believed unconquerable—the track problem.

The Dayton Mechanical Tie Co.
DAYTON, OHIO


here's the old boy!
We made this 10 years ago!

And the order went out in 10 days

One reason that you get faster service from EUREKA is because our records, drawings and patterns are a marvel of neatness and accuracy.

Everybody who steps into our shop just bubbles over in praise of the ship-shape arrangement, with everything where it can be found.

Next time you are near North East, stop in and let us show you.

If we've ever made a part for you, you can get duplicates quick—

And if we haven't, then most likely we have made the same part for somebody else.

Anyhow, it pays to try us and see—because of the time you will save, the reasonable prices you will get, and the very highest quality parts.

Remember EUREKA for

Commutators, Commutator Bars. Brush Holders, either standard or special. Copper leaf and Gauze Brushes. Collector Rings and Soles. Controller fingers, segments, field plates, etc. Trolley wheels, Collector wheels, etc. Bearings and Bushings. Line Material. Switches. Copper and brass washers and nuts. Copper hammers, etc.

EUREKA COPPER PRODUCTS CORPORATION
81 Clay St., North East, Pa.

"You'll say: EUREKA! I've found it: Prompt service, high grade electrical parts, and reasonable prices."

Shuler
Front Axles

For MOTOR BUSSES

Want to meet our star salesman? He is guaranteed not to out-talk you. He is a sample Shuler Axle. Why not give him the "once over"?

Front Axles
Only

Shuler Axle Co.
Incorporated
Louisville, Ky.

Member of Motor Truck Industries, Inc. of America

ELECTRICAL INSULATION

PERFECT MICANITE INSULATOR REG. U.S. PAT. OFF. and PERFECT EMPIRE INSULATOR REG. U.S. PAT. OFF.

Micanite and Super-Micanite Sheets, Commutator Segments, and Commutator Rings

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias *(Yellow or Black Varnished Tapes)*

Empire Oiled Cloths and Papers *(Yellow or Black)*

Compounds, Varnishes, Etc.

Send for catalog and helpful booklet on Commutator Insulation and Assembly

MICA INSULATOR COMPANY
World's Largest Manufacturer of Mica Insulation
Established 1893
New York: 68 Church St. Chicago: 542 So. Dearborn St.
Cleveland Pittsburgh Cincinnati
San Francisco Los Angeles Seattle
Works; Schenectady, New York; Victoriaville, Canada; London, England

TRIBLOC Chain Hoist

This hand chain Guide is always painted GREEN

Costs more to make
Costs less to use !

This shows the Tribloc Chain Hoist—¼ to 2-ton size.

IT IS always painted GREEN for two reasons.

It identifies a chain hoist unequaled for long, hard service on any sort of a job. It also indicates what is probably the most important protective feature of any chain hoist made—the LOOP HAND CHAIN GUIDE.

This Guide absolutely controls the hand chain while in motion. It prevents the hand chain from buckling or "gagging" in the guide—at high speed or at an angle from the hoist.

Send for Catalog 7-B

FORD CHAIN BLOCK COMPANY
2nd and Diamond Streets,
Philadelphia, Pa.

TRUCK WITH TOWER IN RUNNING POSITION

TRENTON TOWER
This 3-Section

is not only more convenient, but stronger than the older type.

The top section is reinforced by the intermediate section. The 3-section design makes it possible to raise the platform 16 inches higher and drop it 12 inches lower than can be done with the old-style 2-section tower.

We'll gladly send you details.

J. R. McCARDELL CO.
Trenton, New Jersey, U. S. A.

"American"

Light and Heavy SPRINGS

Advantageous location for prompt delivery of raw materials—Ample equipment of modern automatic machinery and appliances — Pyrometer equipped furnaces assuring accurate, uniform heat treatment and over 35 years' spring manufacturing experience constitute a service which means satisfaction.

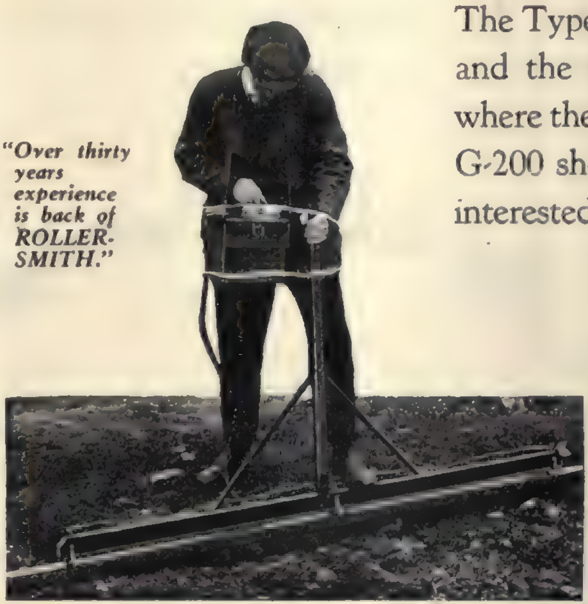
May we estimate on your needs?

AMERICAN SPIRAL SPRING & MFG. CO.
Established 1887
ARSENAL STATION
PITTSBURGH, PA.,
U. S. A.

ROLLER-SMITH BOND TESTERS

are known and used all over the world

They are the Standard with which all others are compared



"Over thirty years experience is back of ROLLER-SMITH."

The Type SBT is recommended for all ordinary work and the Super-Sensitive Type BBT for conditions where there is little or no current in the rail. Bulletin G-200 should be in the hands of every man who is interested in bond testing.

Your copy is ready.

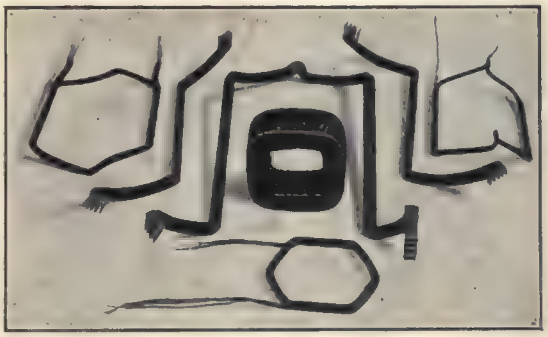
ROLLER-SMITH COMPANY

Electrical Measuring and Protective Apparatus

Main Office:
2140 Woolworth Bldg.,
NEW YORK

Works:
Bethlehem, Pennsylvania

Offices in principal cities in U. S. A. and Canada
Representatives in Australia, Cuba and Japan



Whenever You Run Short of Coils

Has winter "shortening" caused a shortage in your stock of coils?

Replenish this stock with Columbia Coils—built as all coils ***should*** be built—on modern machinery, with the highest grade materials and with accurate dimensions that fit the slot.

Columbia prices, moreover, are short of the figure you would expect to pay for Columbia quality. May we quote you on your coil requirements?

COLUMBIA 1892 MACHINE WORKS

Railway Supplies and Equipment
Machine and Sheet Metal Work, Machinery, Grey Iron and Brass Castings, Patterns, Forgings, Armature and Field Coils

The
Columbia Machine Works & M. I. Co.
263 Chestnut Street. Cor. Atlantic Avenue **Brooklyn, N. Y.**

AXLES

MORE than sixty years of experience in the manufacture of axles, coupled with every facility for correct heat treatment and accurate testing, insure the meeting of the specification in the finished product.

Prompt deliveries of Car and Tender Axles, Engine Truck and Driving Axles, Electric Motor and Street Car Axles, Miscellaneous Forgings.

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General Offices • Carnegie Building : 434 Fifth Avenue
PITTSBURGH PENNSYLVANIA

1885

Whatever your requirements

specify
Le Carbone Carbon
Brushes

They talk for themselves

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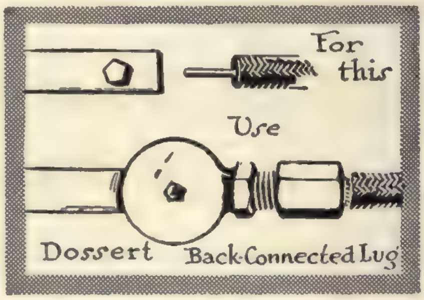
San Francisco Office: 525 Market Street
Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

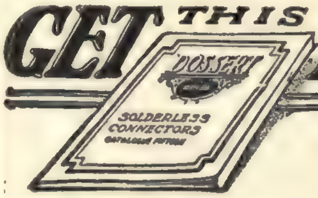


B. C. Lug

The back connected lug is another Dossert—from the large line of standardized electrical connections. All Dosserts have the tapered sleeve principle.

All are shown in the 20th Year Book. Send for your copy.

GET THIS BOOK



FREE

Dossert & Co.
242 West 41st Street
New York, N. Y.

Clark-Williams Tubular Iron Pole Reinforcing and Extension Clamps

Years can be added to the life of any iron pole which has become corroded at the ground level with our REINFORCING CLAMPS, or added height may be obtained by using the EXTENSION CLAMPS.

ALSO MOUNTS FOR WOOD POLES.

Ask for quotations on your requirements.

The Clark-Williams Engr. Co.
886 Main St., Bridgeport, Conn.
Represented in Canada by the Canadian Line Materials, Ltd., Toronto, Ont.

Spring Cleaning Time Is Here!

Streets are cleaned up underfoot all the time. Why not clean up overhead this spring—for all time?

Do your city a service. Save money for yourself.

It is entirely unnecessary to have three or four poles doing the work of one. A single Elreco Tubular Steel Pole will carry all the wires and Novalux Lighting Unit as well.

Elreco Poles impart a trim, clean appearance to any street and are handsome, adaptable, *economical to install and maintain.*

Catalog on request.

The Electric Railway Equipment Co.

2900 Cormany Ave., Cincinnati, O. 30 Church St., New York, N. Y.

Do You Think You Could Build a Nuttall Trolley?

You doubtless could if you knew what grade of metal to put in the foot, the swivel, the pole socket, etc.—if you knew where they had to be reinforced to withstand strains and where they had to be lightened to keep down weight; if you knew a reliable foundry that could furnish suitable castings; if you had $60,000 worth of special machinery, tools, jigs, reamers, drills, etc., but even so, if you didn't have 35 years of experience and a crew of skilled mechanics you couldn't *equal* a Nuttall Trolley. So why should you think anyone else could?

Why should you buy just trolley poles, trolley harps, trolley wheels? If they cost less than Nuttall's its poor economy anyhow because they are worth less. And it is worth something *more* to get with your purchase the feeling of confidence inspired by a product you know is *right*.

Buy genuine Nuttall Trolley parts, poles, wheels, harps, from Nuttall.

R.D.NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

Griffin Wheels
with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban Railways

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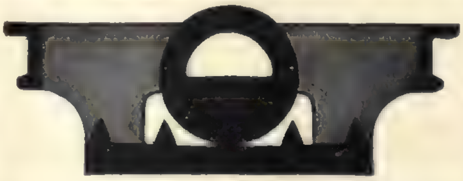

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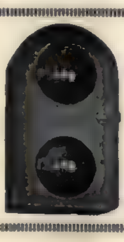

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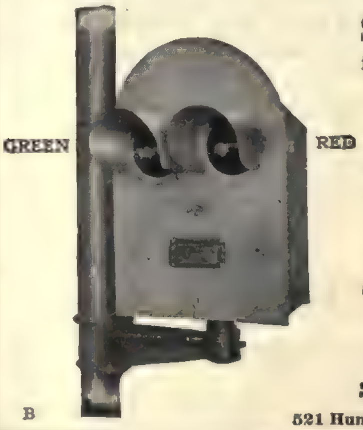

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GENERAL manager available. Technical graduate, broad experience both city and interurban, also light and power properties. Excellent record in straightening out labor difficulties, maintaining harmony and reducing operating costs. Particularly successful in public relations work. PW-3, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

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PRESENT manager of street railway property in Middle West operating 70 cars and 65 buses, desires change for personal reasons. Forty-five years of age. Twenty years' practical experience. Correspondence solicited. PW-987, Electric Railway Journal, Bell Telephone Building, St. Louis, Mo.

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Johns-Manville Corp.
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(Continued on Page 76)

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(Continued on Page 78)

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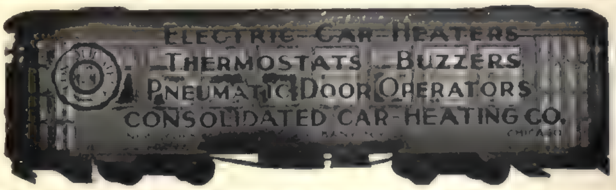

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ALPHABETICAL INDEX TO ADVERTISERS

Page
American Appraisal Co., The 68
American Brass Co., The 77
American Bridge Co 72
American Car Co 79
American Creosoting Co 54
American Electrical Works 72
American Insulating Mach. Co. 72
American Spiral Spring & Mfg. Co. 64
American Steel & Wire Co 72
American Steel Foundries 6
American Strombos Co., The 69
Anaconda Copper Mining Co 77
Archbold-Brady Co 71

Babcock & Wilcox Co 71
Bates Exp. Steel Truss Co 71
Beeler Organization, The 70
Bemis Car Truck Co 77
Bethlehem Steel Co 20
Bibbins, J. Rowland 71
Bridgeport Brass Co 16
Brill Co., The J. G. 79
Buchanan & Layng Corporation. 70
Buda Co., The 60

Cameron Electric Mfg. Co 77
Carnegie Steel Co 66
Chillingworth Mfg. Co 53
Cincinnati Car & Coach Co 35
Clark-Williams Engineering Co. 66
Cleveland Fare Box Co., The. 68
Cleveland Tanning Co 40
Collier, Inc., Barron G 58
Columbia Machine Works & M. I. Co., The 65
Consolidated Car Fender Co., The 77
Consolidated Car Heating Co 77
Cummings Car & Coach Co 37

Day & Zimmermann, Inc 70
Dayton Mechanical Tie Co., The Insert 61-62
DeLaval Separator Co., The 52
Differential Steel Car Co., The 72

Page
Dossert & Co. 66
Drew Electric & Mfg. Co 59
Drum & Co., A. L. 70

Earll, C. I. 69
Economy Electric Devices Co. 8-9
Electric Equipment Co 73
Electric Railway Equipment Co. 67
Electric Railway Improvement Co. 55
Electric Service Supplies Co 5
Elliott-Thompson Electric Co 75
Eureka Copper Products, Inc 63

Fitzjohn Mfg. Co 25
Ford, Bacon & Davis, Inc 70
Ford Chain Block Co 64
"For Sale" Ads 73

General Electric Co., 21-22-Back Cover
General Tire & Rubber Co., The. 30
Globe Ticket Co 36
Gold Car Heating & Ltg. Co 71
Graham Brothers, Insert 41-42-43-44
Griffin Wheel Co 68

Hale-Kilburn Co 31
Haskelite Mfg. Corp 77
"Help Wanted" Ads 73
Hemingray Glass Co 69
Hemphill & Wells 70
Holst, Englehardt W 70
Hubbard & Co 77
Hyatt Roller Bearing Co 49

International Motor Co., Insert 11-12-13-14
International Oxygen Co 71
India Tire & Rubber Co 24
International Creosoting & Construction Co 57
International Register Co 75

Page
International Steel Tie Co., Front Cover
Irvington Varnish & Insulator Co. 75

Jackson, Walter 70
Jeandron, W. J 66

Karpen, S. & Bro 45
Kelly-Springfield Tire Co 28
Kelker, DeLeuw & Co 70
Kuhlman Car Co 79

Lang Body Co 73
Le Carbone Co 66
Linn & Marshall, Inc 70
Lorain Steel Co., The 75

Mack Trucks Inc., Insert 11-12-13-14
McCardell Co., J. R 64
McClellan & Junkersfeld 70
McGraw-Hill Publishing Co., Inc., 38-39
Metal & Thermit Corp 18
Mica Insulator Co 64
More-Jones Brass & Metal Co. 68

Nachod and United States Signal Co., Inc 69
National Brake Co., Inc 23
National Pneumatic Co 15
National Railway Appliance Co. 72
Naugle Pole & Tie Co 77
Nichols-Lintern Co., The 75
Nuttall Co., R. D 67

Oakite Products, Inc 68
Ohio Brass Co 7
Okonite-Callender Cable Co., Inc., The 77
Okonite Co., The 77

Perey Mfg. Co., Inc 77
Portland Cement Association 56
Positions Wanted and Vacant 73

Page
Railway Track-work Co 4
Railway Utility Co 71
Ramapo-Ajax Corp 77
Richey, Albert S 70
Roebling's Sons Co., John A. 71
Roller-Smith Co 65

St. Louis Car Co 32-33
Safety Car Devices Co 17
Salzberg Co., Inc., H .E 73
Samson Cordage Works 77
Sanderson & Porter 70
Searchlight Section 73
Shuler Axle Co 63
Smith Heater Co., Peter 77
Standard Oil Co 48
Standard Steel Works Co 47
Star Brass Works 75
Stevens & Wood, Inc 70
Stone & Webster 70
Stucki Co., A 71
Sullivan Machinery Co 60

Texas Co., The 46
Tool-Steel Gear & Pinion Co. 50-51

Una Welding & Bonding Co 71
United States Rubber Co 19
Universal Lubricating Co 75

Van Loan Corp., Irving S 73
Valentine & Co 34

"Want" Ads 73
Wason Mfg. Co 79
Waukesha Motor Co 29
Westinghouse Electric & Mfg. Co. 2
Westinghouse Traction Brake Co. 10
Wharton, Jr. & Co., Wm 72
"What and Where to Buy" 74-76-78
White Engineering Corp., J. G. 70
Wish Service, The P. Edw 71
Wood Co., Chas. N 71

Yellow Truck & Coach Mfg. Co., 26-27

WHAT AND WHERE TO BUY—Continued from page 76

Splicing Compounds
U. S. Rubber Co.
Westinghouse E. & M. Co.
Splicing Sleeves (See Clamps and Connectors)
Spray Nozzles
Drew Elec. & Mfg. Co.
Springs
National Railway Appliance Co.
Springs, Car and Truck
American Spiral Spring Co.
American Steel Foundries
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Brill Co., The J. G.
Cincinnati Car Co.
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Brill Co., The J. G.
Cummings Car & Coach Co
St. Louis Car Co.
Steel and Steel Products
American Steel & Wire Co.
Carnegie Steel Co.
Steps, Car
Brill Co., The J. G.
Cincinnati Car Co.
Stokers, Mechanical
Babcock & Wilcox Co.
Westinghouse E. & M. Co.
Stop Signals
Nichols-Lintern Co.
Storage Batteries (See Batteries, Storage)
Strain, Insulators
Electric Service Supplies Co
Ohio Brass Co.
Westinghouse E. & M. Co.
Strand
American Steel & Wire Co
Roebling's Sons Co., J. A.
Street Cars (See Cars, Passenger, Freight, Express, etc.)
Superheaters
Babcock & Wilcox Co.
Sweepers, Snow (See Snow Plows, Sweepers and Brooms)
Switch Stands and Fixtures
Ramapo Ajax Corp.
Switchboards, Asbestos
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Switches
Eureka Copper Products Co.
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Switches and Switchboards
Consolidated Car Heating Co.
Electric Service Sup. Co.
General Electric Co.
Westinghouse E. & M. Co.
Switches, Tee Rail
Ramapo Ajax Corp.
Switches, Track (See Track Special Work)
Synchroscopes
Roller-Smith Co.
Tampers, Tie
Railway Trackwork Co.
Tapes and Cloths (See Insulating Cloth, Paper and Tape)
Tee Rail Special Track Work
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co. Inc.
Telephones and Parts
Electric Service Sup. Co
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American Steel & Wire Co.
Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)
Thermostats
Consolidated Car Heating Co.
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Ticket Choppers & Destroyers
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Towers and Transmission Structures
Archbold-Brady Co
Bates Expanded Steel Truss Co.
Westinghouse E & M Co.
Tower Wagons and Auto Trucks
MacCardell & Co., J. R.
Track Expansion Joints
Wm. Wharton, Jr. & Co., Inc.
Track Grinders
Metal & Thermit Corp.
Railway Trackwork Co.
Ramapo Ajax Corp.
Una Welding & Bonding Co.
Track, Special Work
Bethlehem Steel Co
Columbia Machine Works & M. I. Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.
Trackless Trolley Cars
Brill Co., The J. G.
St. Louis Car Co.
Transfers (See Tickets)
Transfer Tables
American Bridge Co.
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Ohio Brass Co.
Trolley Bases, Retrieving
General Electric Co.
Nuttall Co., R. D.
Ohio Brass Co.
Trolley Buses
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.
Trolley Materials
Drew Elec. & Mfg. Co.
Trolley Material (Overhead)
Electric Service Sup. Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Trolley Shoe
Miller Trolley Shoe Co.
Trolley Wheel Bushings
More-Jones Brass & Metal Co.
Star Brass Works
Trolley Wheels (See Wheels, Trolley)
Trolley Wire
American Brass Co.
Amer. Electrical Works
American Steel Foundries
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Anaconda Copper Min. Co.
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Electric Service Sup. Co.
Perey Mfg. Co., Inc.
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Brill Co., The J. G.
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Haskelite Mfg Corp.
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Electric Ry. Improvement Co.
General Electric Co.
Metal & Thermit Corp.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.
Welding Steel
Electric Ry. Improvement Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Welding Wire
American Steel & Wire Co.
General Electric Co.
Railway Trackwork Co.
Roebling's Sons Co., J. A.
Welding Wire and Rods
Railway Trackwork Co.
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Wheel Presses (See Machine Tools)
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Bemis Car Truck Co.
Carnegie Steel Co.
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Westinghouse E. & M. Co.
Westinghouse Traction Brake Co.
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Amer. Steel & Wire Co.
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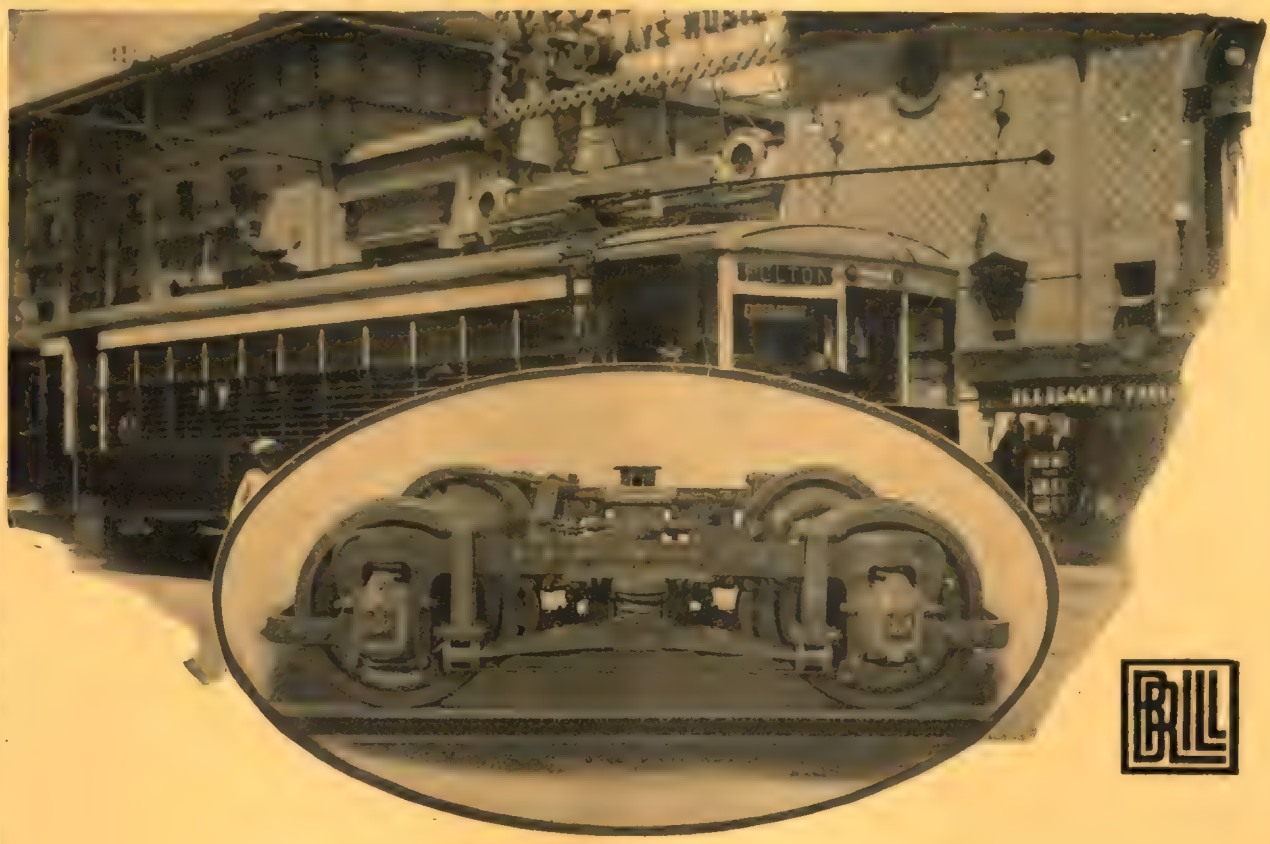

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Write for Bulletin No. 306

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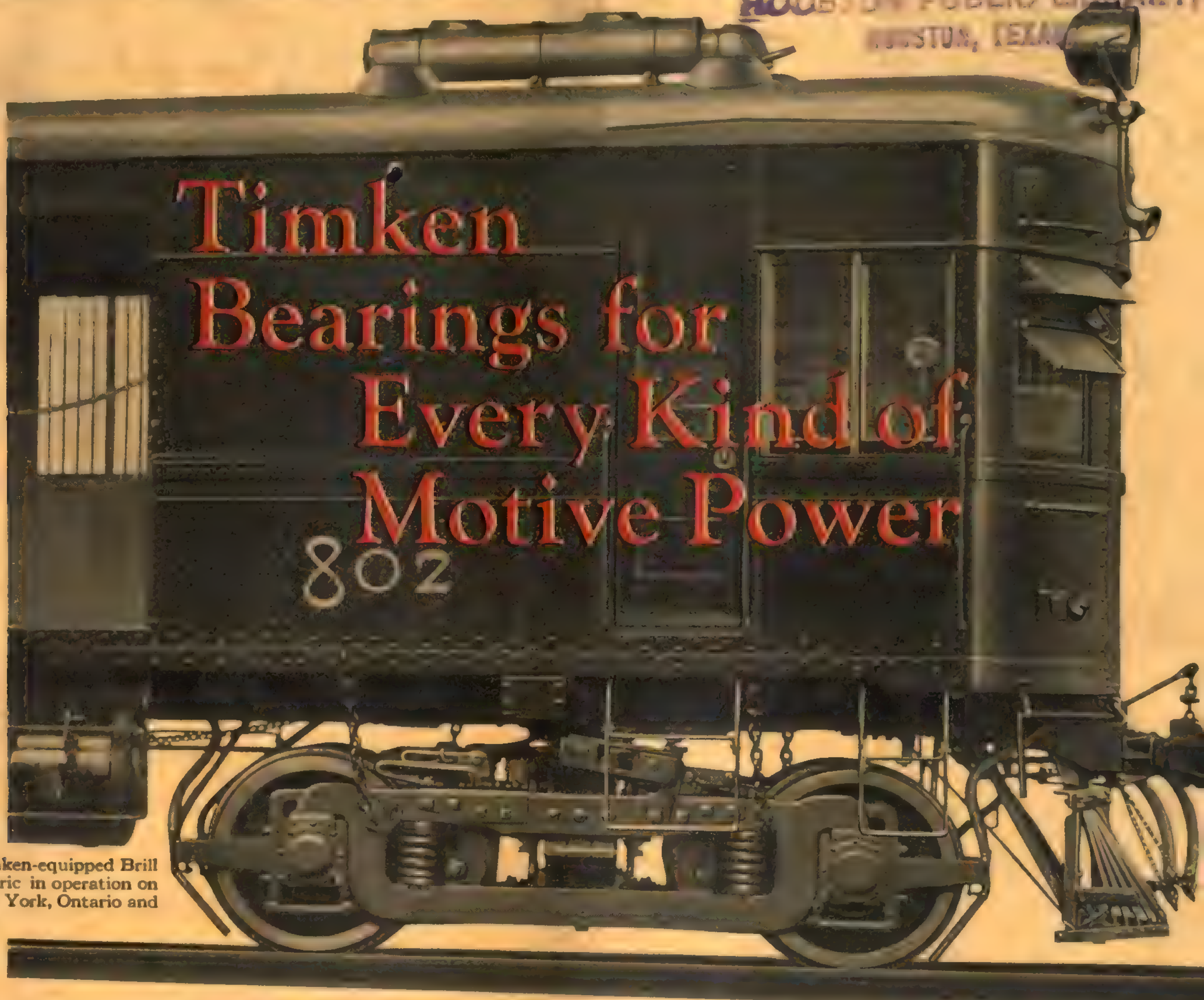

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Vol. 69
No. 22

CONTENTS

Pages
937-984

MAY 28, 1927

Editorials 937

Standardization of Traffic Control Recommended . . 940

Joint committee of municipal officials and representatives of lighting industry in New York State suggests general adoption of two-color indications with all turns made on green light.

Montreal Tramway Installs Modern Suburban Station 944

Transportation in the Eternal City 945

BY HENRY W. BLAKE.

Rome's hills and narrow streets in the downtown section complicate its transportation problem. Some favorable conditions are present and the trolley cars are carrying the bulk of the traffic.

Momentary Stresses Developed While Bucking Railway Motors 951

BY L. M. ASPINWALL.

A maximum torque fourteen times the full load value may occur under certain conditions. High current peaks may result in cracked shafts and pinions or other mechanical damage to a motor.

Joliet Worm-Drive Trucks Impress Railway Men During Tests 954

Experimental trucks were mounted under temporary body for demonstration runs. Fixed bolster construction proves successful.

Laundry Drier for Wet Uniforms 956

Consolidation of Dispatching Towers Boon to North Shore Service 956

The Readers' Forum 957

Improved Employment Conditions in St. Louis 957

Maintenance Notes 958

New Equipment Available 960

Maintenance Data Sheet 961

Association News and Discussion 965

Reproduction Cost Unsatisfactory as Basis for Rate Making 965

BY HON. LEWIS GOLDBERG.

Causes of Radio Interference Analyzed 967

BY JAMES THOMPSON.

Accidental and Intentional Radio Interference 968

BY E. F. BICKFORD

Efforts to Reduce Radio Interference Successful at Concord 969

BY J. B. CRAWFORD.

American Association News 970

News of the Industry 971

Recent Bus Developments 975

Financial and Corporate 976

Personal Mention 979

Manufactures and the Markets 982

"On Fame's Eternal Camping Ground"

MEMORIAL or Decoration Day is America's greatest and most beautiful tribute to her military heroes. The desire to decorate the last resting place of the Blue and the Gray quickly became the outstanding sentiment of a united nation, a sentiment that has been enhanced by the heroism of our 50,000 men who won immortality in France.

As in war, so in peace we have "fame's eternal camping ground." In every industry there is a host of fearless spirts that have bivouacked with the dead. Their rendezvous with death was not on the battlefield, urged on by the glamor and glory of the charge. They received no magnificent gesture of muffled drums or marching troops; no orators bespoke their praise from flag-bedecked rostrums. In all but a few instances no marble slab perpetuates a panegyric of their accomplishments. Yet they were courageous soldiers in the battle of progress whose objective is service to one's fellow man.

When we are remembering those warriors who rest at home and in "some corner of a foreign field," let us not forget the rank and file in our own industry. Those generous souls, those fearless personalities who helped to make transportation an art. Although we cannot give them the tribute of military panoply, we can for one moment on this coming memorial day pause to remember their virtues, to reflect on the value of their friendship and to gain inspiration from the record of their deeds. In so doing, who can tell but that that host of lost comrades, listening from the nether land, will realize the truth of those lines: "To live in the hearts we leave behind is not to die."

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SAVING THE RAIL SAVES THE RAILWAY

Rail—asset or liability?

Whether the rail-borne vehicle can compete with rubber tired transportation depends primarily on the condition of the rail.

Certainly your cars cannot be quieter, more comfortable or more economical than modern buses or private cars if your track is rough.

And nothing else you can do will overcome the absence of smooth, well maintained rail.

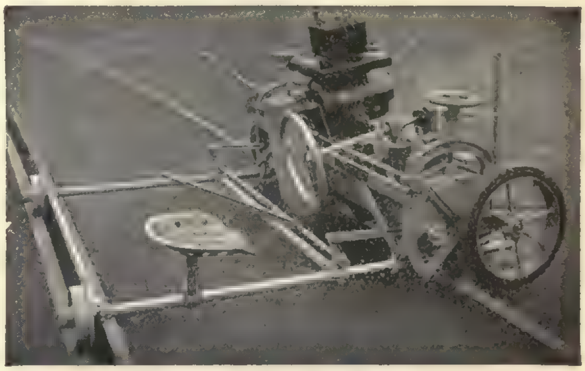
To rejuvenate old rail and keep it young is the job of these modern grinders and welders. They do it economically.

Details? Be sure you have them.

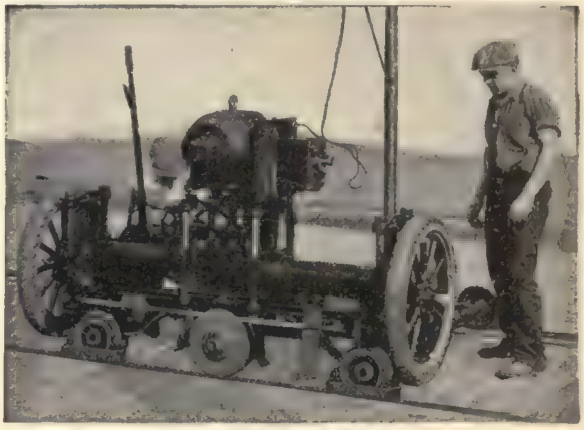
Railway Trackwork Co.
3132-48 East Thompson Street, Philadelphia

AGENTS:
Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
H. F. McDermott, 208 S. LaSalle St., Chicago
P. W. Wood Ry. Supply Co., New Orleans, La.
Equipment & Engineering Co., London
Frazar & Co., Japan

1818

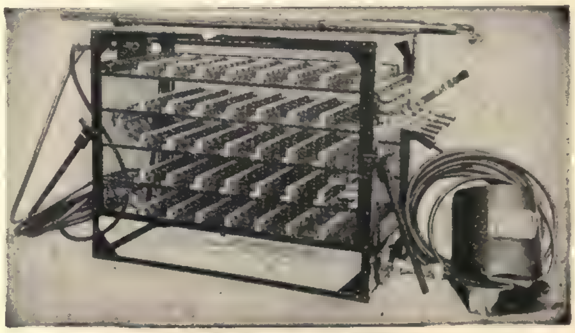


"Improved Atlas" Rail Grinder



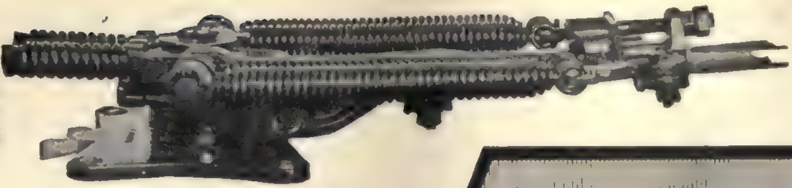
"Imperial" Track Grinder

Reciprocating Track Grinder

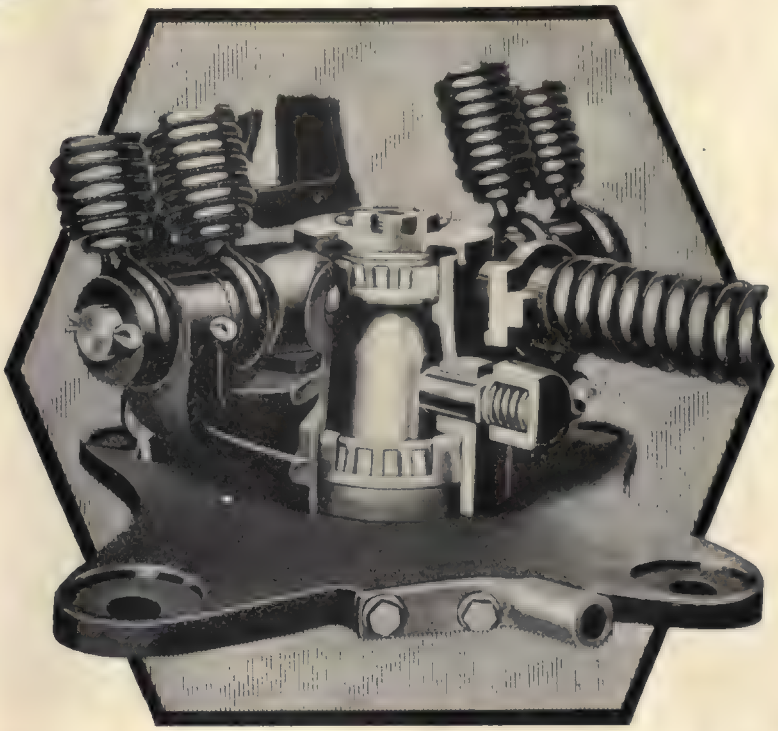


"Ajax" Electric Arc Welder

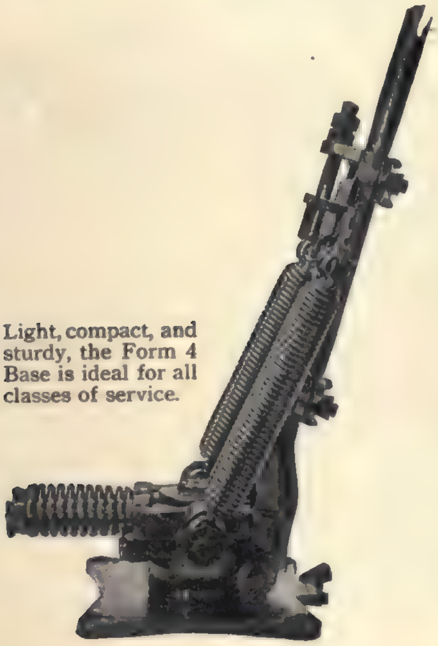
SAVING THE RAIL SAVES THE RAILWAY



Position when "hold down" latch is engaged, ready for changing of pole. Overall height 6½-in.



O-B assembly of Timken Bearings, and phosphor bronze contact for shunting the current.



Light, compact, and sturdy, the Form 4 Base is ideal for all classes of service.

Floating on Timkens—

THE weight of the turret assembly, trolley pole, trolley wheel and harp, as well as the thrust load which results from the pressure of the trolley wire, is *floated* on Timkens.

This *floating principle*, which the O-B application of Timken Tapered Roller Bearings exemplifies, does more than distribute the load uniformly. It minimizes friction and wear, insures permanent alignment, gives you a trolley base that swings true and free indefinitely.

Nothing could be simpler, yet so completely effective. It is one of the features of the O-B Form 4 Trolley Base that has made possible new low records in cost of maintenance.

Packed in cup grease and fully protected against dirt and weather by the turret housing, the bearings are practically unaffected by length of service.

May we send you Folder 48C which explains this and other features in detail? Address

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
330C

Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

The Yew Bow Of Merrie England

WHEN English archers withstood the assault of the flower of European chivalry they pinned their confidence on the English long bow.

Every bow was of tough, resilient English yew—chosen for its superior qualities as the best material for bow making.

So, too, does the "One-Wear" idea depend for its success upon the material entering into wheel manufacture.

Only a special composition heat-treated steel could give the Davis Steel Wheel its "One-Wear" qualities. With Davis Wheels "One-Wear" is more than a name—it is a quality that belongs to the Davis Wheel by reason of the material entering into it.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

In Binghamton—

IN Binghamton the street railway officials undertook to modernize their service. The first step was to order new cars. The second and equally as important a step was to *modernize the track*. Wisely, Binghamton decided on Steel Twin Ties. They now have paved track construction that defies time, holds the rails permanently in place, and has reduced their car mile operating costs.

Have you thoroughly investigated *all* kinds of paved track construction? The Paved Track Notebook has a fund of data on this subject. May we send you your copy together with delivered prices and the man-hour estimate sheet to use with your local cost for estimating your paved track work?

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track

The Automotive Air Brake, a product of the Westinghouse Air Brake Company, who has spent fifty-eight years in brake research, development, and manufacture, is recommended and supplied, as standard factory equipment, by the foremost manufacturers of modern motor coaches.

Why The Westinghouse Air Brake

1. Air Brakes increase revenue in coach operation, by facilitating the use of vehicles of high carrying capacity, and permitting higher schedule speeds in safety.

2. Air Brakes save time, by allowing coach drivers to confidently hold close formation in traffic lines, eliminating the annoying small car cut-ins from side lanes.

3. Air Brakes, by their unique equalizing feature, eliminate side sway at retarding intervals—and prolong life of linings, by uniformly distributing wear.

4. Air Brakes give longer vehicle life, through their smooth action, by eliminating chassis and body strain caused by unequal gripping of shoes.

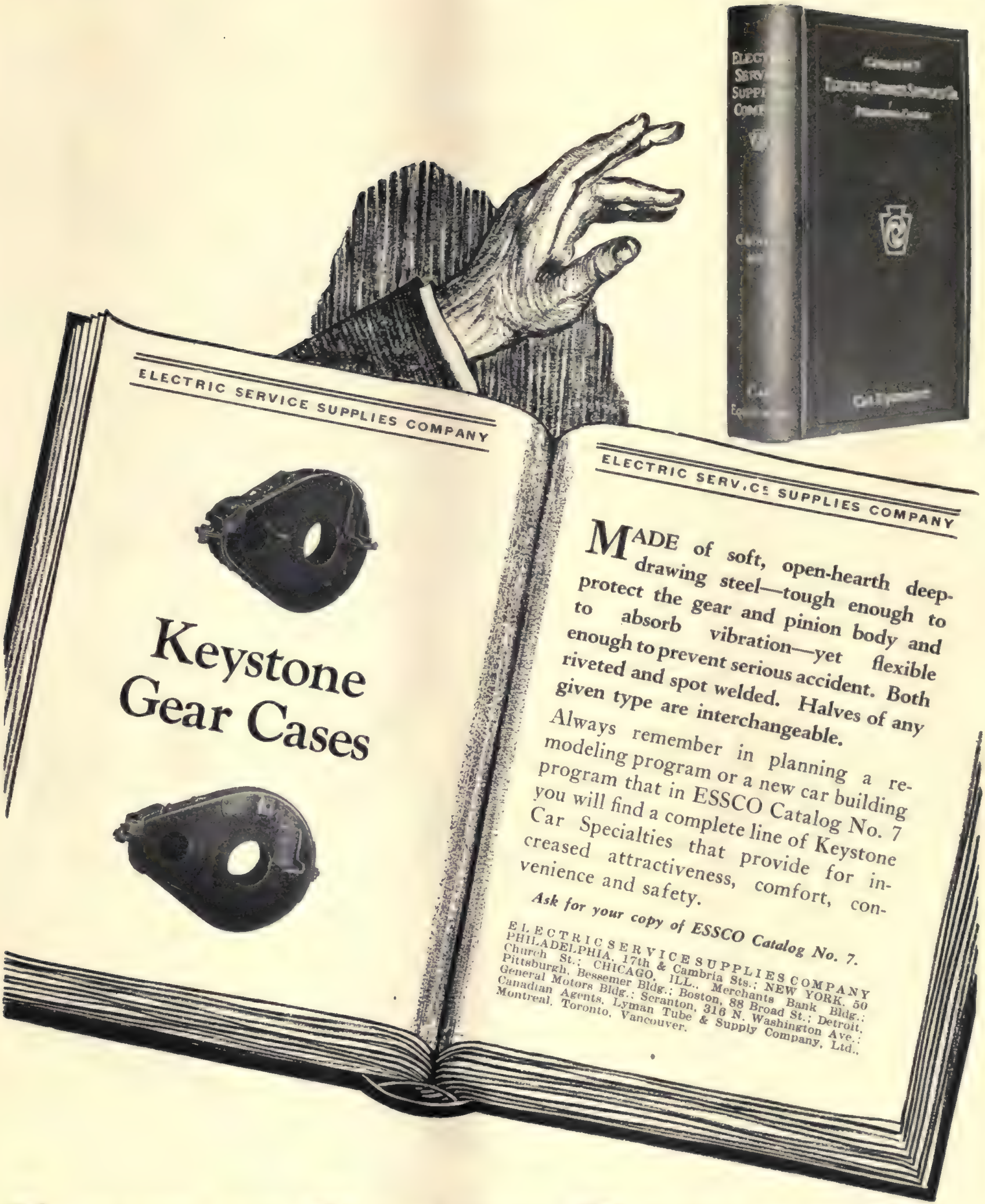
5. Air Brakes make for satisfied operators—by minimizing physical effort in braking, one of the most arduous operations, in modern coach control.

6. Air Brakes stimulate public confidence in the stopping ability of the modern heavy coach whose power and speed range rivals that of the trimmest roadster.

WESTINGHOUSE TRACTION BRAKE CO.
Automotive Division, Wilmerding, Pa.

WESTINGHOUSE
AUTOMOTIVE AIR BRAKES

6180



ELECTRIC SERVICE SUPPLIES COMPANY

Keystone Gear Cases

ELECTRIC SERVICE SUPPLIES COMPANY

MADE of soft, open-hearth deep-drawing steel—tough enough to protect the gear and pinion body and to absorb vibration—yet flexible enough to prevent serious accident. Both riveted and spot welded. Halves of any given type are interchangeable.

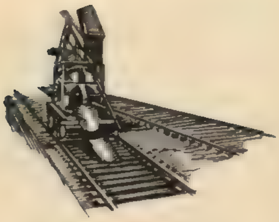
Always remember in planning a remodeling program or a new car building program that in ESSCO Catalog No. 7 you will find a complete line of Keystone Car Specialties that provide for increased attractiveness, comfort, convenience and safety.

Ask for your copy of ESSCO Catalog No. 7.

ELECTRIC SERVICE SUPPLIES COMPANY
PHILADELPHIA, 17th & Cambria Sts.; NEW YORK, 50 Church St.; CHICAGO, ILL., Merchants Bank Bldg.; Pittsburgh, Bessemer Bldg.; Boston, 88 Broad St.; Detroit, General Motors Bldg.; Scranton, 316 N. Washington Ave.; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL



Just a little more concrete than needed for paving—

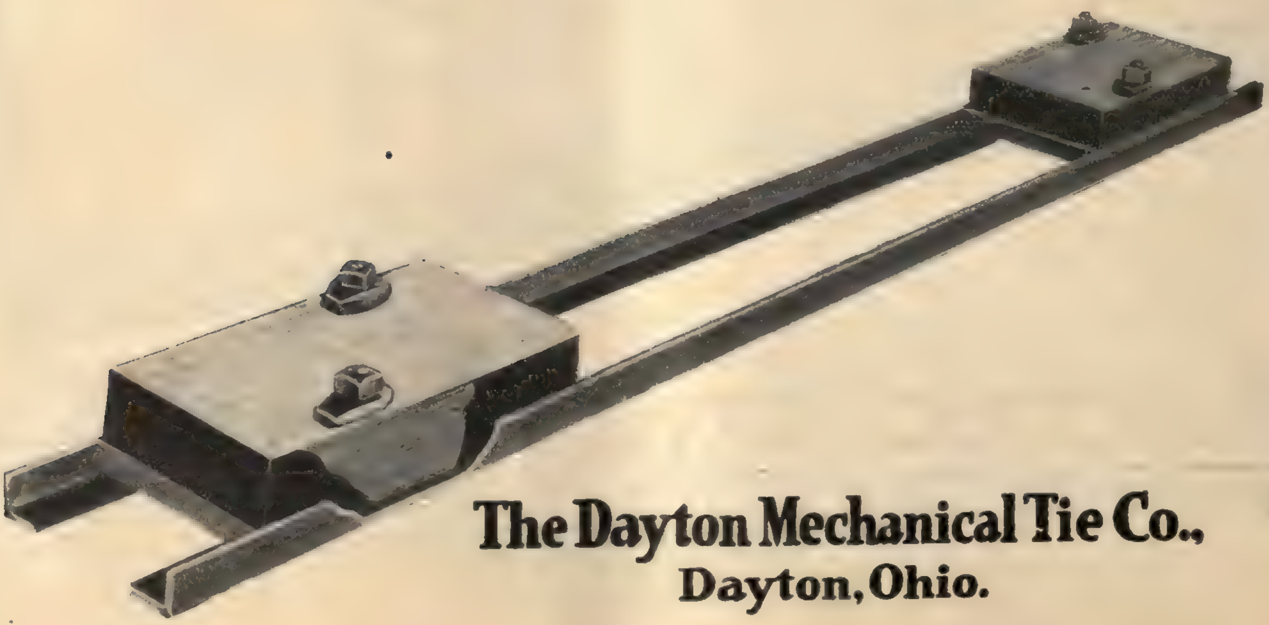
Economy of concrete—general economy in installation—that is why engineers are regularly using Dayton Ties to cut cost per track foot to astonishingly low figures.

And don't forget—Dayton Ties completely absorb vibration which would otherwise destroy the concrete.

Result—Track which will stay for years.

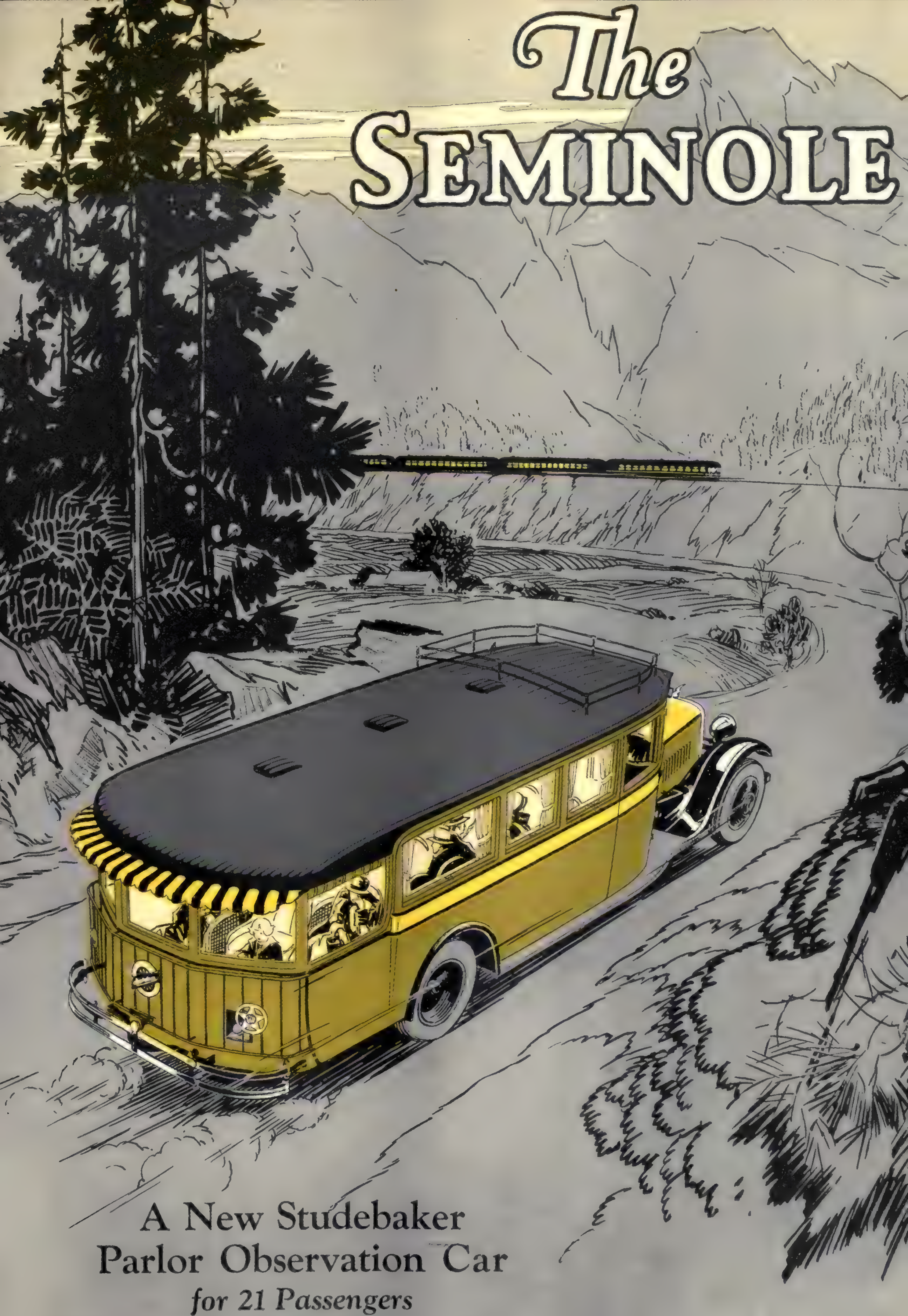
Since the inception of Dayton Ties 15 years ago, not one penny has been spent for maintenance.

It will pay you in many ways to get the "Dayton Idea" from your neighbor—or write us for the facts.



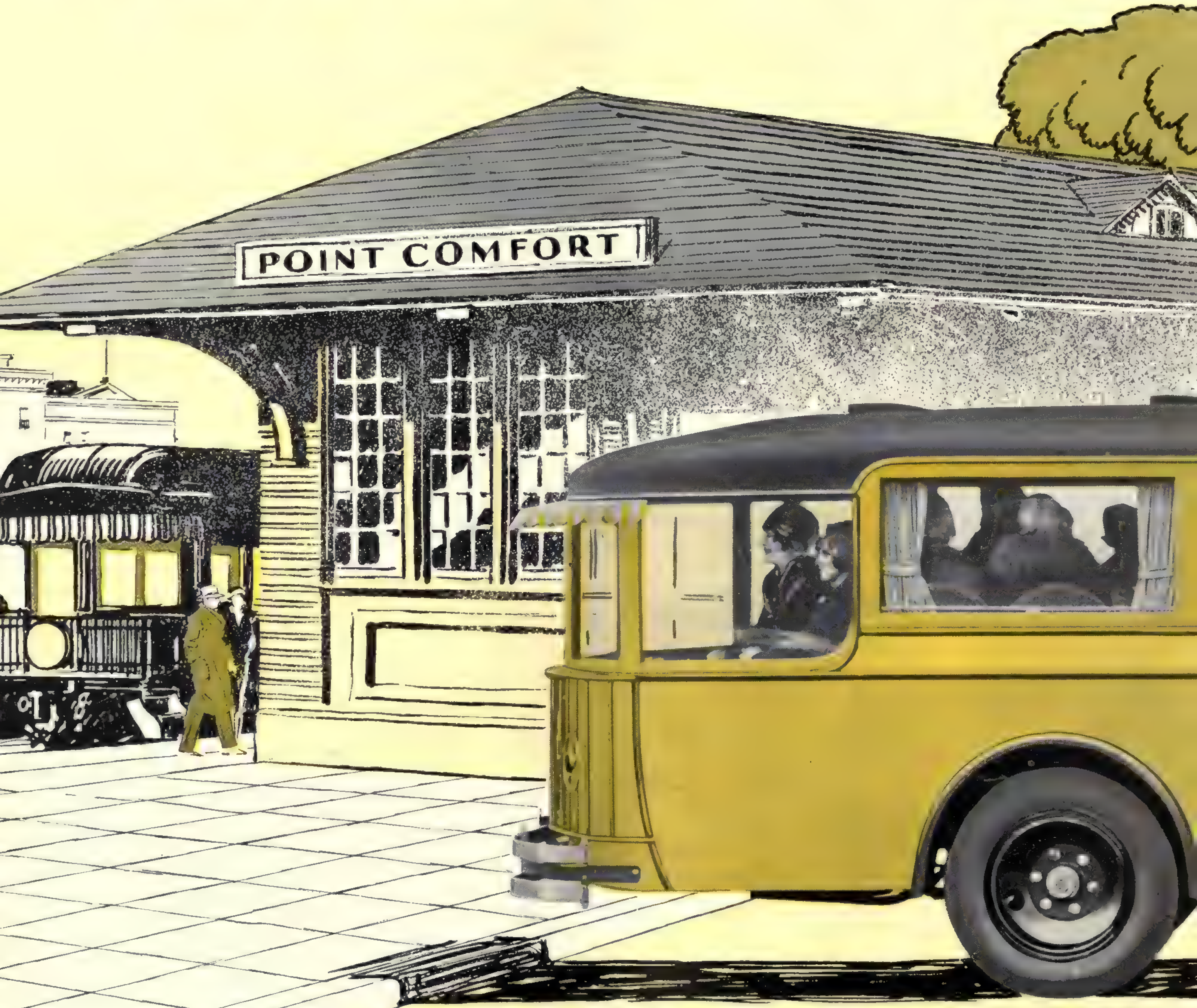
The Dayton Mechanical Tie Co.,
Dayton, Ohio.

The SEMINOLE



A New Studebaker
Parlor Observation Car
for 21 Passengers

Matchless Luxury of



ULTRA-MODERN in every sense of the term, The Seminole, Studebaker's new observation car for 21 passengers, is mounted on the Studebaker "75" heavy duty bus chassis. This sturdy chassis, with its powerful motor and excess capacity units, have been thoroughly tested on Studebaker's 800-acre proving ground.

For interurban traffic of the better class or on extended tours it possesses the degree of comfort and luxury so essential in catering to a discriminating public.

Its outward appearance is suggestive of the conventional Pullman—the long

Mounted on

The new Studebaker 75

The SEMINOLE

Rivals the Palatial Pullman $6895

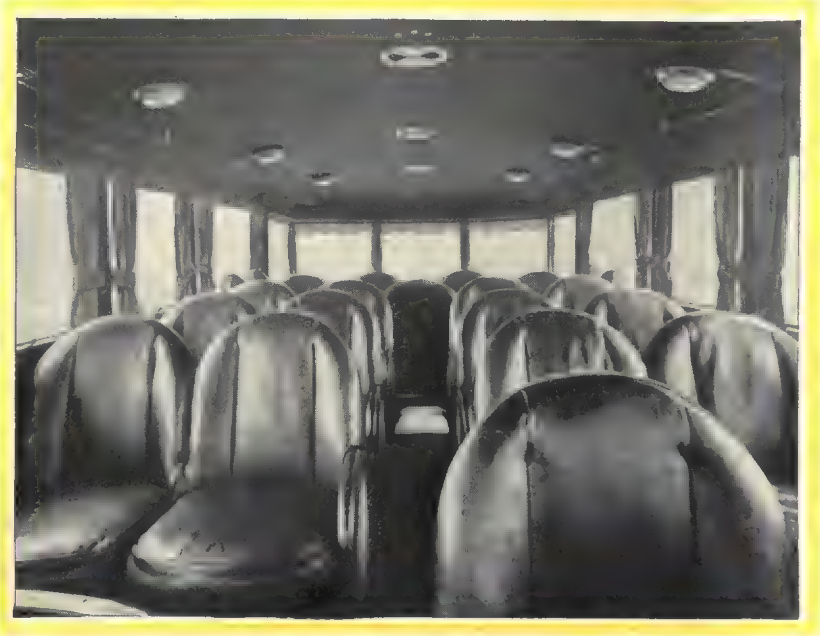
f. o. b. factory

low lines of the body blend gracefully into the cowl and hood. At the rear, ornamental grille work and an overhanging top accentuate the observation car impression.

The low first cost of The Seminole, plus its exceptionally low operating expense insures greater profits with less invested capital. Over 2000 Studebaker busses are on the roads in all parts of the country, operating at a profit. "Give a company good Studebaker busses, a corps of efficient drivers, a little advertising and any bus company will succeed" says a man operating 142 busses, 72 of which are Studebakers.

Heavy Duty Bus Chassis

Superlative Comfort Pays Real Dividends



From the driver's compartment looking toward the rear. Riders are impressed with the unusual roominess of this coach. The body is 83 inches wide inside, easily accommodating the twin-seating arrangement for 12 passengers facing forward and 4 side facing chairs with a wide aisle which leads to the glass enclosed observation bay where 5 passengers are comfortably seated. The head room of 62½ inches permits easy access to any part of the coach. Superlative riding comfort is obtained by the use of deeply upholstered seats (built to the operator's individual desires) set at a lounging angle with ample leg room for every passenger. In addition to the front loading door, which is controlled by a hidden lever, there are two doors on the left, one for the driver and a service door in the center.

THE SEMINOLE — Studebaker's new observation car — is designed to provide superlative comfort. Deep lounging seats, wide aisles, unobstructed vision, adequate ventilation and quiet operation insure utmost comfort.

And constancy of schedules maintained by a thoroughly dependable chassis and a powerful motor creates a confidence which builds a lasting clientele.

Under the hood the famous Studebaker 75 horse-power motor gives abundant power. Four-wheel self-energizing brakes give the driver positive control at permitted speeds.

The heavy duty transmission has four speeds forward which permits easier starting in traffic and a greatly increased driving range on steep grades. A double disc clutch 17″ in diameter is used for its proved efficiency in bus operation.

A special heavy duty rear axle of great truss strength is employed for ability to give long, uninterrupted service.

With long special bus springs and full balloon tires this parlor car rides with rail-like smoothness.

Every practical means of obtaining maximum riding comfort and providing certainty of performance together with economical operation have been incorporated in The Seminole.

Prices of Studebaker Busses

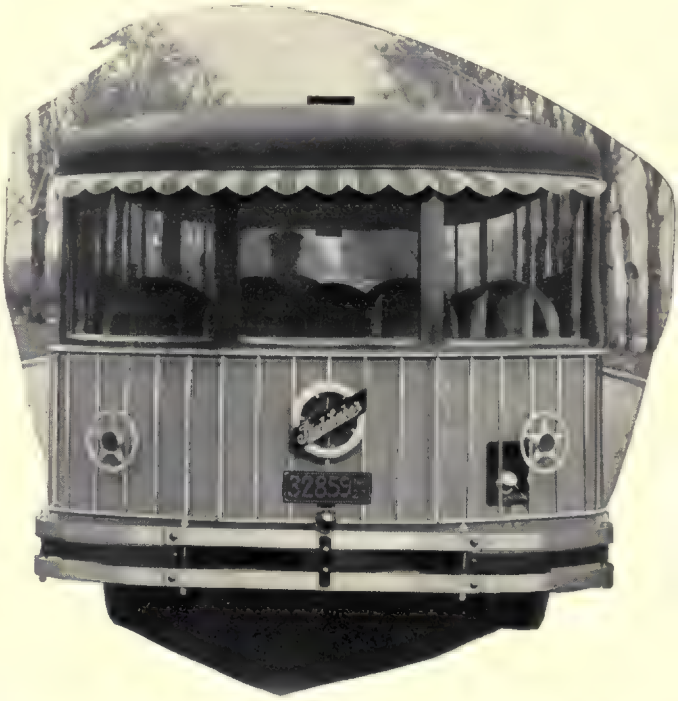
Studebaker "75" Chassis only*	$3275.00
Studebaker "75" Parlor Observation Car*	6895.00
Studebaker "75" 21 Passenger Street Car bus*	5895.00
12 Pass. (including driver) cross-seat Sedan-Type	3935.00
15 Pass. (including driver) cross-seat Sedan-Type	4295.00
19 Pass. (including driver) cross-seat Sedan-Type	5050.00
18 Pass. (including driver) side entrance Parlor Car	5300.00
20 Pass. (including driver) Parlor Car De Luxe*	6150.00

*Includes dual rear wheels.

All prices f. o. b. factory. Purchase can be arranged on Liberal Budget Payment Plan.

THE ruggedly built body of The Seminole will give years of service. The side panels are padded to prevent road noises and the windows which slide in grooves of felt are non-rattling. The floor is covered with heavy linoleum. Seats are hinged at the front for easy adjustment or removal. In the driver's section is a leather covered Pullman seat, set at the proper angle for easy driving. At the right is an enclosed well for baggage. On the dash grouped in an oval under glass and indirectly lighted are the instruments which include: speedometer, ammeter, oil pressure gauge, engine thermometer and eight-day clock.

The equipment is complete and includes: front and rear bumpers; twin-beam acorn headlights; illuminated destination sign; stop signal; two rear traffic signal lights and tail light over the license plate; spare tire carrier and wheel carried on the left side; automatic windshield cleaner and rear vision mirror; special exhaust heater.



The rear view of The Seminole which is designed to simulate the railway observation car in appearance as well as to provide a comparable degree of comfort and convenience. These effects are well carried out by the curved, dust-proof, glass enclosed, rear bay from which five passengers have an uninterrupted view.† The overhanging awning of sheet steel and ornamental grille further the general impression of the standard observation car.

†Optional seating arrangement: Seats in observation bay may be faced forward, giving room for extra seat thus providing seats for 22 passengers.

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HE
TUDEBAKER
ORPORATION
F AMERICA,
ept. B South Bend, Ind.

Ve have...... busses at present

heck below the Studebaker Bus bout which you desire information.

ype: Sedan........ Parlor Car........

treet-Car Type.......

apacity:.............. Passengers.

ame ....

ddress..

IT OPENS
WHEN
IT SHOULD
—but *it stays closed, too*

NP

THE NP Automatic Treadle Exit Door is the safest platform equipment known in one-man service. While always under the operator's control, it cannot open the door while the car is in motion nor can the car start until the door is closed and the last alighting passenger has left the step.

Add to this the fact that it provides for circulating load in every form of one-man service and it is not hard to see why treadle doors have been adopted in more than half a hundred cities.

NATIONAL PNEUMATIC COMPANY
Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

ABB

American BROWN BOVERI

High Efficiency

From fractional output to maximum overload, the efficiency curve of American Brown Boveri Mercury-Arc Power Rectifiers is higher in nearly every case than that of rotary equipment. Average converting losses are, at extremely low load factor, *cut down appreciably* at rail voltages as low as 600 V.

The charts on the opposite page indicate Mercury-Arc Power Rectifier performance in a 750 kw. 600 volt substation belonging to an Interurban Railroad in one of the Eastern States.

PRINCIPAL PRODUCTS

Mercury-Arc Power Rectifiers (steel enclosed)
Electric Locomotives—for any system of current, high or low tensions
Complete equipment for railway electrification
Rotary Converters
Motor Generators
Complete equipment for outdoor and indoor substations.
Diesel-Electric Locomotives
Automatic Regulators
Steam Turbo-Generators for normal or high pressures and superheats
Oil Switches and Circuit Breakers

Transformers

Turbo-Compressors and Blowers

Ships
Diesel Driven
Turbine Driven
Electrical Driven

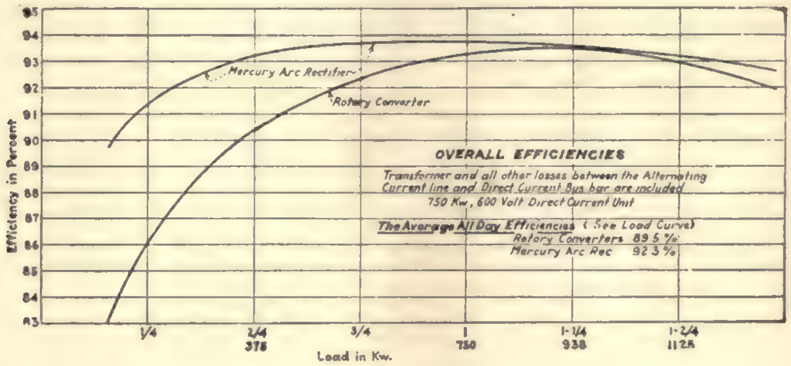
Dredges and Harbor Equipment

ABB

Mercury-Arc Power Rectifiers

at all Loads

The average all day overall efficiency for Mercury-Arc Power Rectifiers is shown to be 92.3%, while for rotary converters it drops to 89.5%. Extended over a 20-hour day the saving amounts to more than 200 Kw.-Hr. or, at one cent per kw.-hr., the annual saving effected is $730.00.



Add to this a more than 50 per cent saving in maintenance cost, freedom from synchronizing, low weight, elimination of special foundations, noiseless and vibrationless operation and you will see clearly why Mercury-Arc Power Rectifiers are preferred.

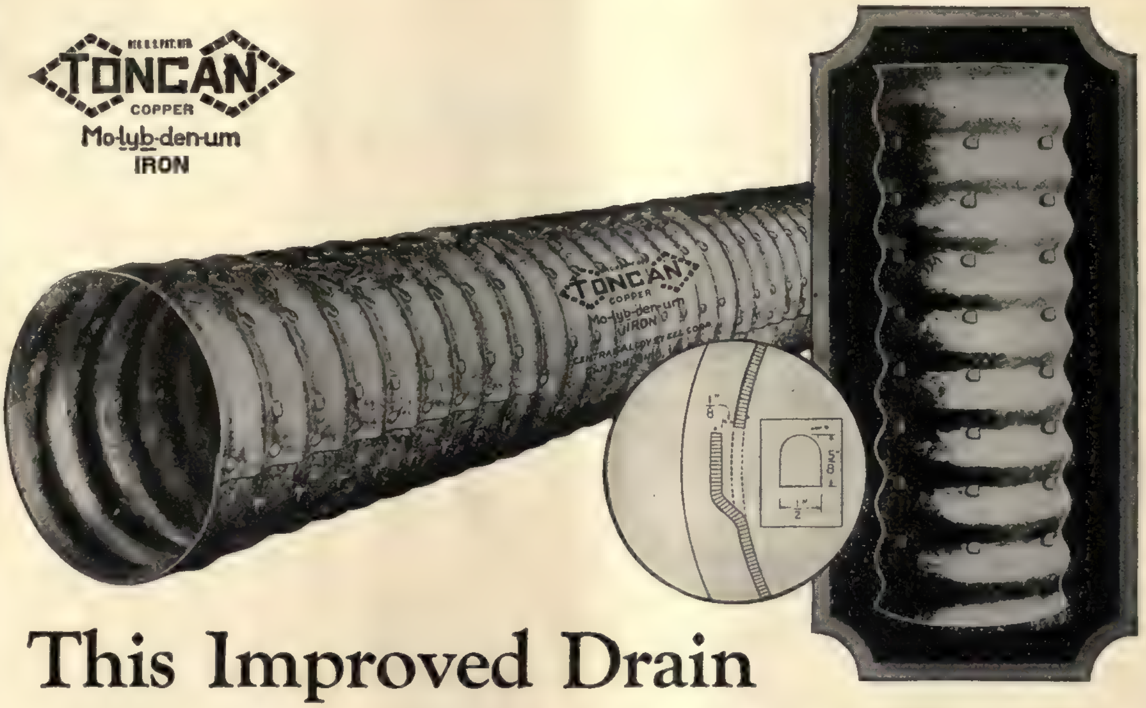
Descriptive Circular No. 301 describes
A-B-B Mercury-Arc Power Rectifiers

American Brown Boveri Electric Corporation

165 Broadway, New York, N. Y. Camden, New Jersey
922 Witherspoon Bldg., Philadelphia. 842 Summer St., Boston. 230 South Clark St., Chicago

MEMBER AERA 1927

AMERICAN
BROWN BOVERI



REG. U.S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

This Improved Drain Developed In Toncan Iron

FOR seventeen years, Toncan Iron Drains have been in railroad service. Miles of them have been carrying off sub-surface water and keeping the adjacent soil free from excessive moisture.

Now the makers of Toncan Iron have designed a greatly improved drain—the Type "B".

Instead of the usual holes, rows of outward-tongued perforations provide highest drainage efficiency while retarding the entry of dirt.

Consequently, this new Drain is more free from dirt-clogging, while long life is inherent—it is made of Toncan Iron, the metal of greater corrosion resistance because of its copper and mo-lyb-den-um content.

For better drainage, elimination of breakage and alignment troubles for many years to come, look into this new and vital Drain improvement, made only in Toncan Iron.

Following are the makers of Toncan Culverts. Write the nearest one:

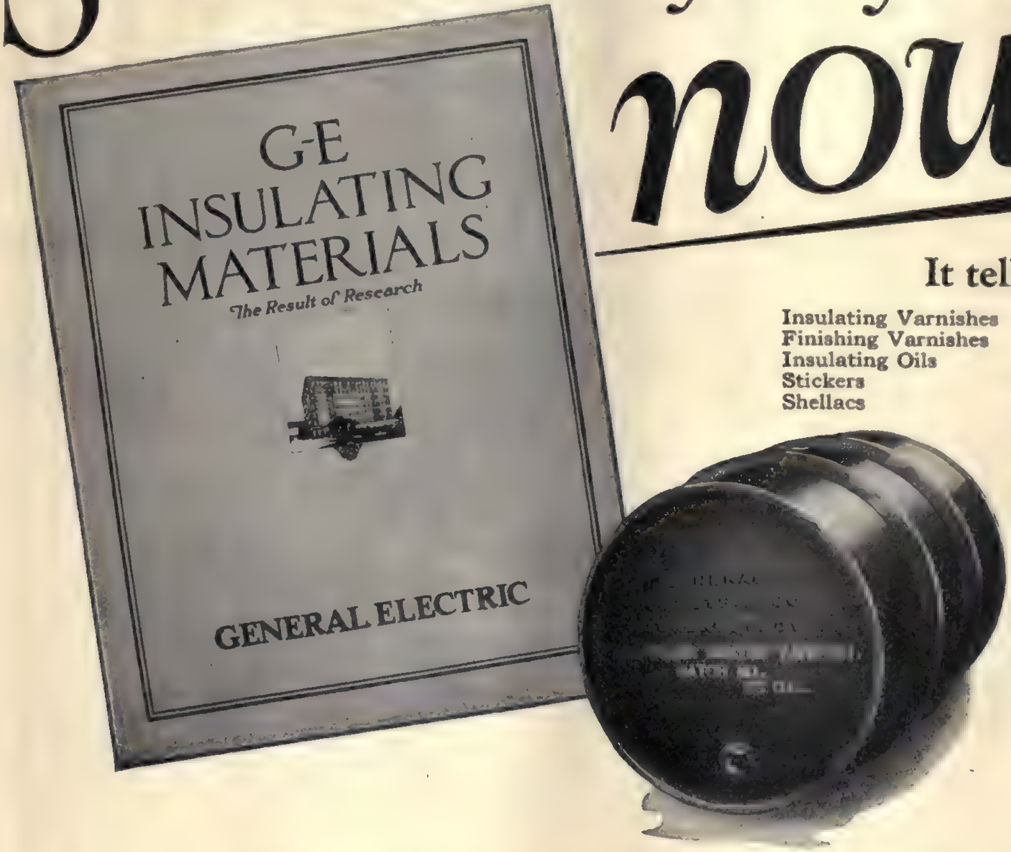
The Berger Manufacturing Co. Roanoke, Virginia
Tri-State Culvert Mfg. Co. Memphis, Tenn
The Canton Culvert & Silo Co. Canton, Ohio
The Firman L. Carswell Mfg. Co. Kansas City, Kan.
The Berger Manufacturing Co. Minneapolis, Minn.
The Berger Mfg. Co., of Mass. Boston, Mass.
The Berger Manufacturing Co. Philadelphia, Pa.
The Berger Manufacturing Co. Dallas, Texas
The Berger Manufacturing Co. Jacksonville, Florida.
The Pedlar People Limited, Oshawa, Ontario, Canada
Wheat Culvert Co., Inc. Newport, Ky.

CENTRAL ALLOY STEEL CORPORATION, *Massillon,* OHIO
World's Largest and Most Highly Specialized Alloy Steel Producers
Makers of Agathon Alloy Steels

Cleveland Detroit Chicago New York St. Louis
Syracuse Philadelphia Los Angeles Tulsa
Cincinnati San Francisco Seattle

TONCAN COPPER MO-LYB-DEN-UM **IRON**

Shall we mail you your copy *now?*



It tells about—

Insulating Varnishes
Finishing Varnishes
Insulating Oils
Stickers
Shellacs
Paints
Filling Compounds
Sealing Compounds
Varnish Treated Cloths
Varnish Treated Cloth Tapes
Insulating Fibers
Insulating Papers
Flexible Varnished Tubing
Motor Tubing
Asbestos and Cotton Tapes
Friction and Rubber Tapes
Prepared Paper Tapes
Cords and Twines

YOU can treat your coils with the same high grade varnish that insulates the coils in original General Electric equipment. When insulation means so much and costs so little in comparison with the rest of the job, can you afford to use anything less reliable than this varnish developed in the Research Laboratories of General Electric?

The more popular General Electric Varnishes are:—

No. 460—Black Baking
No. 457—Black Air Drying
No. 450—Clear Baking
No. 152—Clear Air Drying

You will find detailed specifications in the Catalog.

Prompt Service

You obtain better service because G-E Insulating Materials are sold only through ONE source—the G-E Merchandise Distributor. This assures you a shipping point near at hand, complete stocks, speedy deliveries and convenience in ordering.

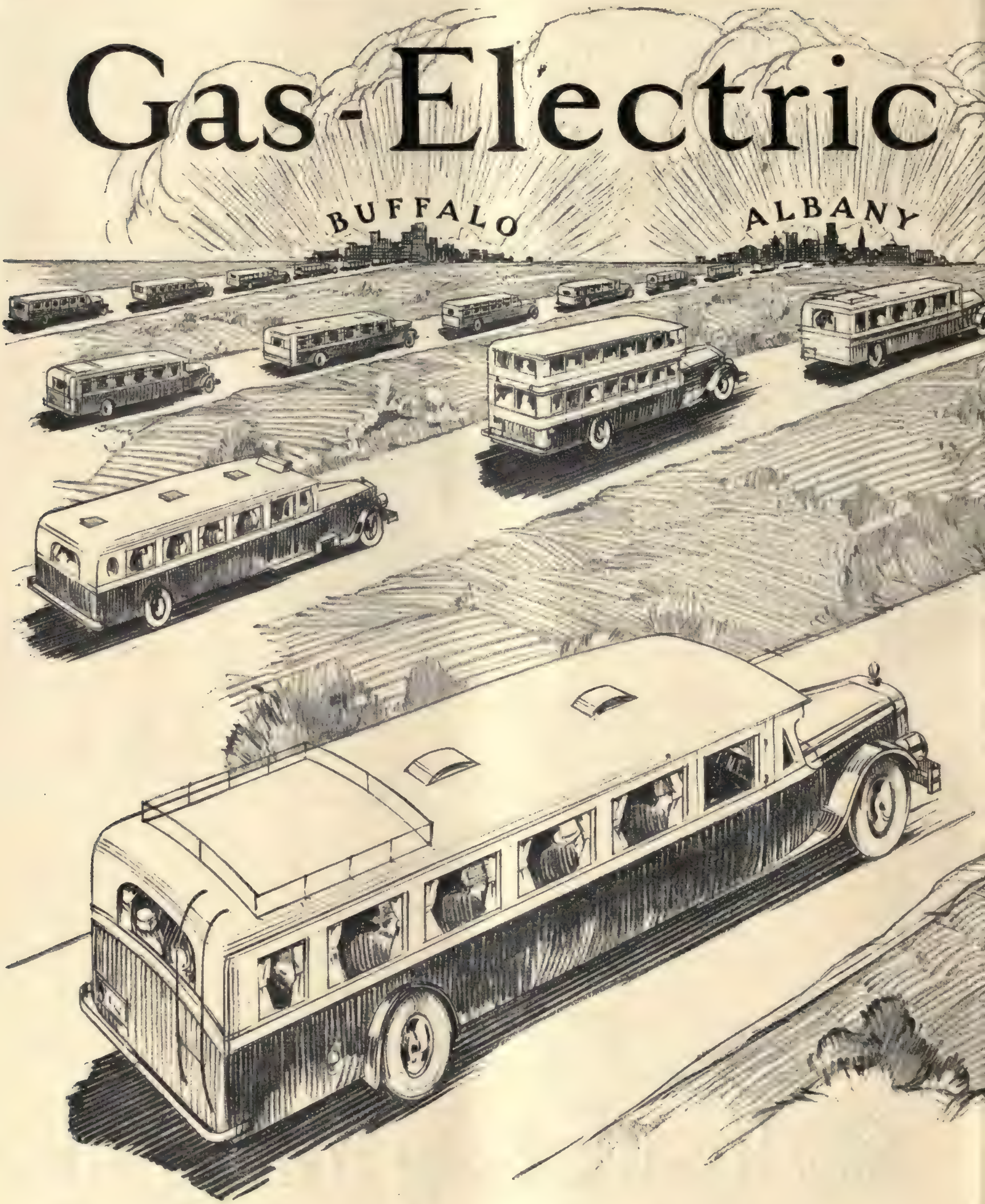
Insulating Materials

800-10

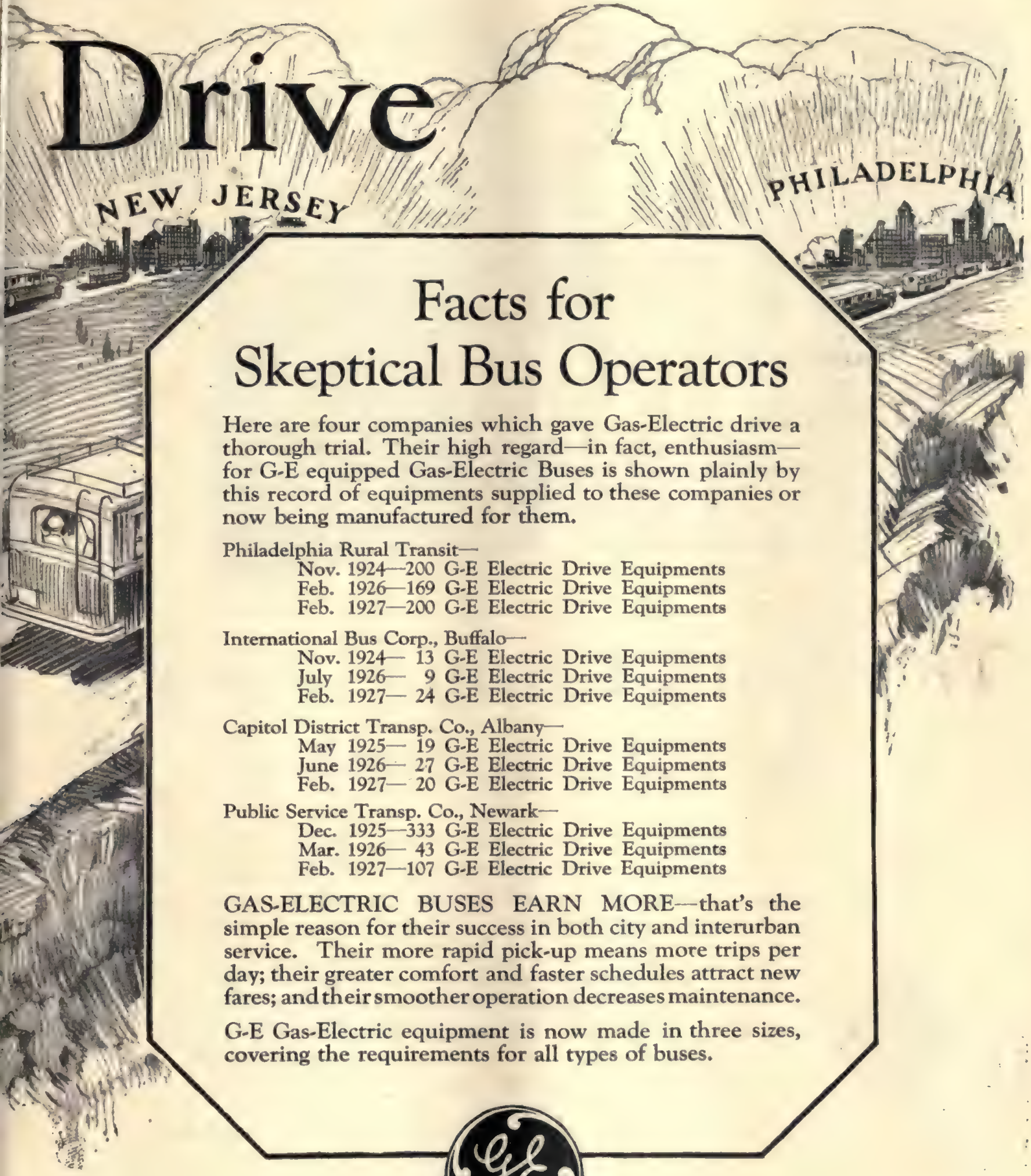
GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT

Gas-Electric



GENERAL
GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.



Facts for Skeptical Bus Operators

Here are four companies which gave Gas-Electric drive a thorough trial. Their high regard—in fact, enthusiasm—for G-E equipped Gas-Electric Buses is shown plainly by this record of equipments supplied to these companies or now being manufactured for them.

Philadelphia Rural Transit—
Nov. 1924—200 G-E Electric Drive Equipments
Feb. 1926—169 G-E Electric Drive Equipments
Feb. 1927—200 G-E Electric Drive Equipments

International Bus Corp., Buffalo—
Nov. 1924— 13 G-E Electric Drive Equipments
July 1926— 9 G-E Electric Drive Equipments
Feb. 1927— 24 G-E Electric Drive Equipments

Capitol District Transp. Co., Albany—
May 1925— 19 G-E Electric Drive Equipments
June 1926— 27 G-E Electric Drive Equipments
Feb. 1927— 20 G-E Electric Drive Equipments

Public Service Transp. Co., Newark—
Dec. 1925—333 G-E Electric Drive Equipments
Mar. 1926— 43 G-E Electric Drive Equipments
Feb. 1927—107 G-E Electric Drive Equipments

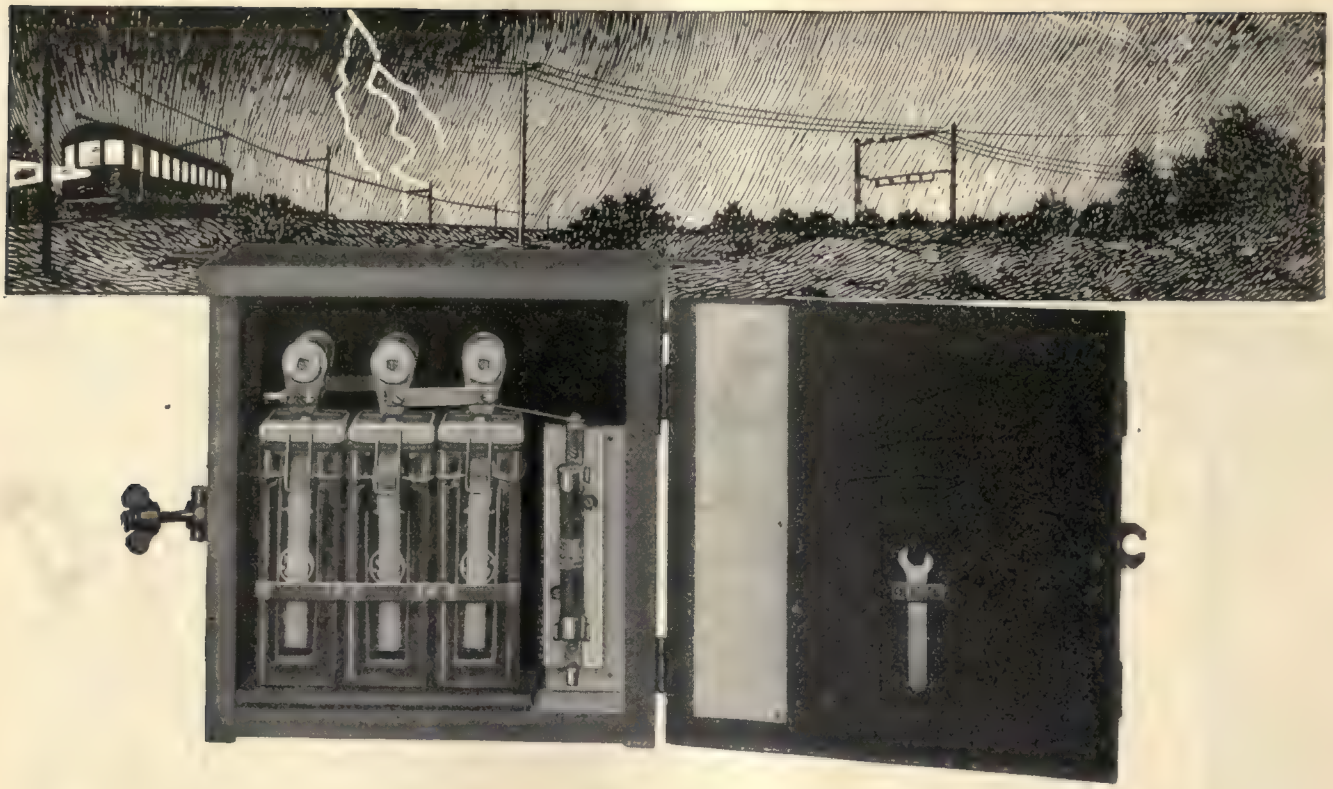
GAS-ELECTRIC BUSES EARN MORE—that's the simple reason for their success in both city and interurban service. Their more rapid pick-up means more trips per day; their greater comfort and faster schedules attract new fares; and their smoother operation decreases maintenance.

G-E Gas-Electric equipment is now made in three sizes, covering the requirements for all types of buses.

390-25

GENERAL ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES



The New Aluminum Arrester for Railway Service

Simplicity and accessibility are two valuable features of this new General Electric D-c. Aluminum Arrester. Master mechanics are sure to be pleased with it.

The high degree of protection given by the d-c. aluminum type of arrester is widely known. In this new arrester the voltage per cell has been reduced one third. This means longer life and fewer replacements.

The new cells with their balancing resistances can easily be placed in the boxes of units now in service. Although these improved arresters have just been put on the market, they have been tested for two years on various railway properties.

General Electric originated the d-c. aluminum type of arrester and now introduces a notable improvement. The famous G-E high-voltage laboratory has been of material assistance in the development of all G-E lightning protective equipment.

442-6

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 28, 1927 *Number* 22

Latest Developments in Chicago Point Toward a Successful Solution

ENCOURAGING transportation news comes from Chicago. An important step has been taken toward unraveling the complicated tangle into which the country's second largest city has permitted its transportation facilities to become ensnarled. An agreement has been reached among the transportation companies on a general program. It is the logical first step toward a solution of that community's outstanding problem.

Again the old formula of straightforward business methods seems to have worked. Once the parties at interest were able to get around a table and frankly to compare their views—motivated by a sincere desire to find a solution which would be at once fair to the community and to the security holders—order began to come out of chaos and the tangled mass of conflicting interests has begun to unravel. Even the hardest knot of all—home rule regulation—shows signs of giving way before patience and co-operation. A suggested county transit commission, consisting of two representatives appointed by the Governor, two by the Mayor and one by the county board, sets up the mechanism for a regulatory body which will be both sympathetic to the city's needs and at the same time protected in a measure from destructive local politics.

Progress in the solution of Chicago's transportation problem has only started. But it *has* started. There are still many hurdles ahead, the first of which is the State Legislature, where five enabling bills must be passed within a month. The City Council and the Mayor have not yet openly expressed their stand. After legislation is passed—if it is passed—there is a franchise to be negotiated. Finally, the whole proposition must be submitted to a referendum of the city's voters.

On the face of things, then, Chicago still is a long way from a final settlement. But there are some very significant factors that point strongly toward ultimate success of the present program. A united front among the companies is the first and probably the most important. They have, however, gone further than that. They have not only agreed on a program, they have openly and frankly stated it. They have put all their cards on top of the table; have gone to the Legislature with what they consider the best plan for the healthy improvement of transportation and have openly told the city and its people that there is no cleverly worded legal phraseology in which jokers are hidden.

This time the Chicago problem is being approached in what must impress all parties at interest as a straightforward, businesslike manner. The modern conception of business dealings is that both parties gain from a transaction. The old theory was that one party is always the loser. Transportation as an industry has suffered much from application of the old principle in dealings between a community and its transportation companies—and the communities have by no means been the only offenders. Chicago is beginning to apply modern business methods to work out its transportation difficulties—and those methods have been successful in every other city where they have been applied.

An Unforgettable Lesson from the Skies

ROGET'S THESAURUS has been exhausted by men and women in every walk of life, in every clime and nation, to praise the incomparable feat of Charles Lindbergh. This blonde scion of a pioneer race is a man whom "the gods delight to honor." In less than 40 hours he advanced the science of transportation to a degree that inflames the imagination and benumbs expression. He "splashed at a ten-league canvass with brushes of comet's hair." The trajectory of his roaring plane described another rainbow for the hearts of men. Hurtling through the uncharted ether, a young man dreamed dreams while old men saw visions.

Our ardor for his physical feat may cool with the years. We may forget the encomiums of kings and presidents, but deep in the consciousness of the American people will always live the tremendous lesson which his daring revivified. In short, that the courage of one's convictions is the lifeblood of the pioneer.

None of us is too great to relearn this lesson which an American youth, this Navigator of Progress, blazoned across 3,000 miles of the heavens.

Workmen's Automobiles— An Economy or a Luxury?

RIDING to work in a private automobile is cheaper than using public transportation, according to an editorial published in the April issue of *Scientific American*. Operating costs are figured in the editorial at 15 cents per automobile-mile, or 5 cents per passenger-mile, on the basis of three persons per vehicle. The fare on the local car and bus line is 10 cents. Apparently science and economics have become jumbled in the thoughts of the writer of this editorial, because he has neglected entirely the vital factor of distance traveled. In the instance to which he refers, the distance probably averages about 4 miles, making the actual cost per trip approximately 20 cents per passenger by automobile, or double the cost of public transportation.

An investigation made last summer by the Norton Company, Worcester, Mass., to discover how many of its employees came to work by automobile was the basis for the editorial. The company found that 740 automobiles were owned by its 2,900 employees. Of these 419 were driven to work daily, carrying on the average three employees each, or 1,257 in all. Thus approximately 40 per cent used automobiles to reach the plant. This investigation was made to determine what parking facilities were needed.

No study was made by the Norton Company of the relative cost of various means of transportation. Nevertheless, as many of the automobiles used by the employees were found to be of small, light types, the average operating cost is doubtless about 15 cents per vehicle-mile, or 5 cents per passenger-mile, as assumed in the *Scientific American's* editorial. As a matter of fact, investigation shows that the cost is seldom if ever divided equally among the three passengers, but is borne largely by the automobile owner. Hence the assumption of 5 cents per passenger-mile operating cost is hardly justified. Moreover, the Norton plant is some 4 miles from the center of Worcester, and many of the employees must travel that or a greater distance to reach their work. When this important factor is considered, the economic advantage swings over quickly to the 10-cent common carriers.

After all that has been written of late about the relative cost of operating street cars, buses and automobiles, it is surprising to find any one who thinks that private transportation is cheaper than public transportation. Tireless efforts are required, however, on the part of the transportation agencies to counteract the mischief done by the dissemination of these false theories. The old adage that the shoemaker should stick to his last still holds good.

For Thirty Years This Company Has Paid Dividends

EVEN allowing for what some are inclined to look upon as a very favorable operating arrangement with the city, the Montreal Tramways management is certainly doing an exceptional job. This is reflected in the digest of the annual report of the company published elsewhere in this issue. The surplus for the year after paying four quarterly dividends of 2½ per cent each, which called for the disbursement of $400,000, was $279,159. Carried forward from the previous year was an accumulated surplus of $1,014,037, so that the surplus at the end of the year recently ended was $1,293,197.

In the face of a showing of this kind it might be expected that there would be a disposition to permit things to remain as they are and to sit back and garner the reward of what has been done in the past. There is, however, no such attitude. The company proposes to carry on and carry on intensively. To this end the directors expect to submit to the civic authorities a general plan of improvement embracing subways and elevated railways.

The railway at Montreal does not operate under conditions that are ideal. The city's climatic conditions, with storms of exceptional severity, constitute a serious problem. Moreover, the grades there are heavier than in any other Canadian city except perhaps Quebec, where the traffic density is not so great as it is in Montreal. Again, the city's older thoroughfares, dating from an age-long past, are very narrow, so that in these sections the railway has a limited use of its own right-of-way. Despite these natural handicaps, the people of Montreal are carried from point to point, season by season, with a minimum of delay and discomfort. Many of these factors are not apparent in the annual report, but they have an important bearing in interpreting the results achieved.

The cynic who may be inclined to scoff at repetition of the aphorism that virtue is its own reward should turn to the record of dividends paid by the Montreal Tramways covering an uninterrupted period of 30 years, and to the statement of the accumulated surplus as it stood on Dec. 31, 1926. As for the officers of the company, it should be heartening to them to know that their efforts to improve the roadbed wherever necessary, increase the fleet of buses, add to the rolling stock and otherwise keep abreast of the times are not escaping public recognition.

Greater Uniformity Needed in Operation of Traffic Control Signals

RADICALLY different rules exist in neighboring cities having traffic control signals. In 27 such cities in New York State nine conflicting regulations are in effect. Only the natives know what is expected of the automobile driver in any particular municipality. Many of the regulations are confusing even to the natives. For example, a traffic policemen in a small town recently explained the local rules by saying, "To turn to the left, you pull over to the right, and when the signals says 'stop' you go."

To remedy the present chaotic conditions a committee appointed by the New York State Conference of Mayors and Other Municipal Officials and the Empire State Gas and Electric Association recommends the adoption of a uniform practice. The recommendation is based on a study of existing practices throughout the state. An abstract of the report of the committee appears elsewhere in this issue. Only general suggestions are made concerning the type of signals and their location. Definite recommendations, however, are made concerning the operation of the signals.

In the opinion of the committee only two colors, red and green, should be used in traffic control signals. The amber light often used between the red and green lights is believed to be unnecessary. Pedestrians should cross an intersection in the direction of moving traffic or during an interval when red lights show in all directions. In warning signals, as differentiated from control signals, the amber light should be used exclusively. All turns should be made on the green light, except as otherwise directed by a police officer or where diagonal streets or other unusual conditions make a variation necessary.

It is emphasized that the purpose of automatic traffic signals is to expedite traffic movement rather than to hamper it. If the system is to be successful, the duration of stoppages due to the signals must be less than would occur without them or the delay must be offset by greater ease or safety of movement. Synchronized progressive and co-ordinate systems are discussed in detail in the report. The progressive system provides continuous movement and discourages speeding. An objection to this system, however, is the necessity to have equal periods for the red and green lights. That is unsatisfactory where there is more traffic on a principal thoroughfare than on the cross streets. Synchronized control is open to criticism because traffic is brought to a dead stop periodically and unnecessary delays often result.

What the committee characterizes as co-ordinated traffic control was developed to overcome the objections to the other two systems. The committee believes that the selection of a particular system must depend largely on the conditions that exist on the street on which the traffic control system is to be used.

Whether or not all of the recommendations meet with general approval, there can be no doubt that standardization is urgently needed. A long time must elapse before the present conflicting regulations are brought into uniformity, but with patience and perseverance it can be done. Standardization of railroad gages has been accomplished, although it was once thought to be impossible. So, too, standardization of traffic control can be accomplished when the resultant advantages are brought home to the public. The report of the committee represents an important step in this direction.

Its Dividends Far Exceed Its Premiums

THE National Safety Council is the spiritual as well as practical expression of the brotherhood of man in industrial life. No one can attend its meetings or review its tremendous achievements without realizing that membership in it is of inestimable value. No other form of life insurance is as cheap considering the benefits it bestows. One does not have to die to realize these benefits. Its dividends far exceed its premiums; premiums that are expressed in healthy, happy, unmaimed men and women. Figure its worth in terms of dollars and cents: Membership per 10,000 employees is only $250. Granting that in a year, by reason of the council's teaching, one life is saved valued at $10,000, there has been made not only a lucrative investment but a definite contribution to humanity.

The council is a co-operative, non-profiting association that numbers among its members the greatest minds in industrial life. Every minute in the day through its agencies human life is being conserved. This alone should make it imperative that every industrial organization and every other organization whose ideal is service should be enrolled as a member.

Florida—and Some Other States—Needs to Get Up to Date

FLORIDA is behind the times in its dealings with public utilities. It is so far behind the times that it is about 30 years out of date. In 1899 it passed a law limiting franchises to a period of 30 years. At that time the public utility industry was in its infancy, particularly in Florida, and it was supposed that irrevocable stipulations could be made for rates, charges and service. To correct this condition a terminable permit bill has been introduced in the Legislature.

So out of date are some people in Florida that it has been found necessary to explain the terminable permit by the eclectic method, despite the fact that the Railroad Commission has on more than one occasion materially increased railway fares fixed by contract, and that the Supreme Court of Florida, confirmed by the Supreme Court of the United States, has held that the Railroad Commission has this right and that it is its duty to make rates compensatory.

To this end Peter O. Knight, president of the Tampa Electric Company and author of the bill recently introduced, is using large newspaper space to enlighten the Legislature. He is reminding the people of Florida that the terminable permit idea has been indorsed by the National Association of Railroad and Utilities Commissioners, Investment Bankers Association of America, the American Bar Association, the National Municipal League, the National Civic Federation and the wartime Federal Electric Railways Commission.

Mr. Knight's statement was made of his own volition. It is a forceful presentation for which he takes entire responsibility, if such a term may be applied to a measure intended to operate in the best interests of everybody concerned and destined to bring Florida up to date with respect to its dealings along economic lines with the utilities which operate within its borders. Yet Mr. Knight has felt it necessary to offer to debate the merits of the bill before the joint session of the Legislature. So far there has been no indication that his challenge is likely to be accepted.

Nothing more effective than the passage of this bill could be done to invite capital into Florida under assurance that its rights will be fully protected. The author of the bill is correct when he says that common sense, good business and integrity all demand that when a public utility obtains a permit to do business in a community, it should be permitted, if it behaves itself and acts properly, to continue with its business unmolested, unless, perchance, the municipality sees fit to purchase the property. There can be no two sides to this question. The matter is incontrovertible.

Less Law and More Common Sense Needed

BEHIND a mahogany bench on a low platform sat three men. Two were chuckling together over some joke. The third dozed. Seated immediately in front of this bench was a middle-aged man fumbling with a mass of papers. In a wearied tone, he was answering questions asked by a bespectacled lawyer at a nearby table, frequently consulting his records for data before replying. From outside came the clatter of street traffic, drowning for short periods the monotonous sequence of question and answer. Apparently the lawyer was trying to trap the witness into some admission that could be used against him later. Nine-tenths of the questions had little or no bearing on the subject under discussion, serving merely to cloak those of real import. Here and there around the large room were scattered six or seven other men. One was reading "Breezy Stories." Another was standing looking out of the window. Several were whispering together. Between trips to the adjacent hallway to "catch a smoke," a couple of newspaper reporters took occasional notes. It was the fourth day of a hearing before the state regulatory commission, sitting to determine the reasonableness of certain fares charged by the local transportation company.

Proceedings such as this are the besetting sin of our present method of utility regulation. Reason and common sense are discarded, while valuable time is wasted in tedious legal arguments—often far away from the point at issue. The public—theoretically an interested party—has neither the inclination nor the ability to follow the endless twistings and turnings of the testimony. Despite their best efforts, the regulatory officials cannot give continuous, close attention to the rambling debate. If in the end a sensible decision is arrived at, it is in spite of these protracted hearings, not because of them. What is needed to improve our methods of utility regulation is less law, fewer lawyers and more common sense.

Standardization of Traffic Signals Recommended

Joint committee of municipal officials and representatives of lighting industry in New York State suggests general adoption of two-color indications with all turns made on green light

ADOPTION of standards for the design, location and operation of traffic signals is recommended by a joint committee of the New York State Conference of Mayors and Other Municipal Officials and the Empire State Gas and Electric Association. The findings of the committee are based on thorough investigation and study. Particular attention has been paid to automatic signal installation. It is recommended that the only colors which should be used in traffic control signals are red and green. Turns should be made on the green light. In warning signals amber should be used exclusively.

In reply to a questionnaire sent out by the New York State Bureau of Municipal Information at the request of the committee, 27 cities stated that they had traffic control signal lights in operation. Of these cities two reported that traffic control signal lights were being installed at the time; even stated that they were installed in 1926 and in six cities they were installed in 1925. In other words, within the past two years nineteen cities of the 27 have undertaken this type of traffic control. This indicates that city officials are giving considerable attention to the subject and also illustrates the need of careful study in order that the best practices may be developed and standardized.

Only one of the 27 cities reported that the lights were not proving successful. In this particular place the officials seem satisfied with the principles of signal light control, but do not feel that their system is adequate for local needs. They state that a change is being considered.

Ten cities reported that the introduction of traffic control lights had effected a considerable reduction in their accidents. One estimated this reduction to be 80 per cent, and five other cities reported that no accidents had occurred at intersections where the signal lights were in operation. Eleven cities stated that the lights had effected considerable relief in traffic. One city claims that this relief is due to the fact that drivers avoid the signals and thus use streets that are not so congested.

In answer to the question, "Are your lights operated singly or from a central station?" the following answers were received:

Singly operated	11
Operated by groups	2
Operated from central stations	9
Combination of central station and central operation	4
No answer	1

The answers to the question, "Are they operated on a synchronized or stagger plan?" are as follows:

Synchronized	16
Individual operation	7
Stagger system	2
No answer	2

In reviewing the returned questionnaires, it was evident that the officials filling them in did not understand the exact meaning of the "stagger plan." For this reason the figures given above are not believed to be absolutely correct.

Five cities report that they are now using the two-light system: One reports that it is now using the three-light system, but is planning to change it to the two-light system. The cities using the two lights seem to feel that this is the safest plan of operation. Only one city, which is now using the two-light system, has worked out a plan for overlapping these signals at the time they are changed.

There is considerable variance in the time allowed for each change of signal in the various cities. This ranges from as small an interval as twenty seconds to an interval of two minutes used for the north and south streets of New York City. The time allowed for the change interval varies from four to twenty seconds. Only a few of the cities make a difference of the time interval for the street of maximum travel as against the other intersecting thoroughfares. Fourteen cities report that the timing of the devices is standard for their community; that is, all lights are operated on the same interval and no change is made to satisfy changing conditions. Seven report that timing is designed to fit conditions at the intersection and four indicate that the traffic signal is operated by hand during heavy traffic.

The regulations in effect in the various cities for making turns at intersections where traffic control signals are used vary somewhat, as shown by the following list:

All turns on green light	16
Right turn on red, left turn on green	2
Right turn on either light, left on green	2
All turns on either green or amber	1
Both turns permitted on red light, if there is no interference	1
Right turn on green, left turn during change interval, but either turn on either color when turning off main street. Right turn on either color when turning off side street	1
No left turns permitted during busy hours	1
No rule on the subject	1
No answer	2

Fourteen cities report that they have no regulation for the control of pedestrian traffic at intersections where signal lights are used. Eight cities report that they have such regulations. Of the cities reporting no regulations three state that the matter is handled by the police officer on the post and that they have been able to obtain the co-operation of the public. Of those having regulations, the following experience has been obtained in enforcing them:

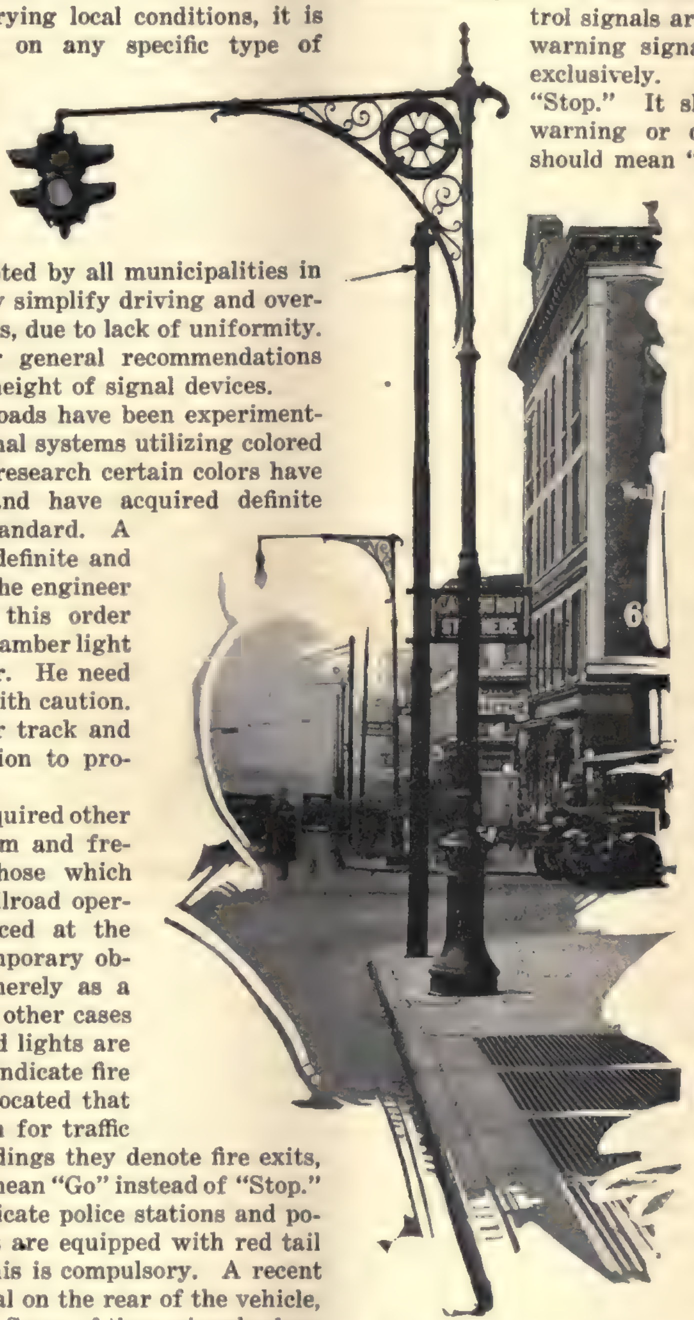
No difficulty	3
Slight difficulty	1
Very difficult	1
Not effective because of lack of penalty	1
No answer	2

On account of widely varying local conditions, it is impractical to standardize on any specific type of traffic signal or signs or any particular layout of control devices. It is possible, however, to recommend a uniform meaning of signals, which if required by state law or in the absence of such, if adopted by all municipalities in New York State, will greatly simplify driving and overcome the present complexities, due to lack of uniformity. It is also possible to offer general recommendations regarding the location and height of signal devices.

For many years the railroads have been experimenting with and developing signal systems utilizing colored lights. As a result of this research certain colors have come into universal use and have acquired definite meanings which are now standard. A red light is an order, very definite and in no case to be ignored, to the engineer to stop. Failure to obey this order brings severe penalties. An amber light is a warning to the engineer. He need not stop, but must proceed with caution. A green light means a clear track and gives the engineer permission to proceed freely.

Colored lights have also acquired other meanings quite distinct from and frequently contradictory to those which have become standard in railroad operation. Red lights are placed at the street excavations or on temporary obstructions, in some cases merely as a warning of danger, while in other cases a full stop is necessary. Red lights are also quite generally used to indicate fire alarm boxes, frequently so located that they may easily be mistaken for traffic control signals. Inside buildings they denote fire exits, and in this case they really mean "Go" instead of "Stop." Green lights are used to indicate police stations and police call boxes. Automobiles are equipped with red tail lights, and in some states this is compulsory. A recent development is the stop signal on the rear of the vehicle, in addition to the tail light. Some of these signals show red, some green and some amber. Devices are also on the market to indicate turns which are about to be made, and some cars, particularly taxicabs, are being equipped with numbers of colored lights, principally red, green and amber, for advertising or display purposes.

The use of colored lights to regulate street traffic is still in the developmental stage. Generally, an attempt has been made to adopt railroad signal methods and meanings to street traffic. The conditions are different and some confusion has been the natural result. This, with the variety of other uses of the same colors, makes it practically impossible for the motorist or pedestrian to know what is expected or required. Steps should be taken at once, first, to standardize on the colors to be used for the regulation of street traffic; second, to adopt definite and uniform meanings for such colors; third, to eliminate other uses of these colors where a different meaning is intended. Mention has been made above of some of these other uses.


Two color signals visible in four directions afford effective control

As a result of its study the committee recommends that the only colors which should be used in traffic control signals are red and green. In traffic warning signals, amber should be used exclusively. Red should always mean "Stop." It should never be used as a warning or cautionary signal. Green should mean "Go." Amber should mean "Proceed with Caution." It should be used exclusively and only for precautionary signals, either fixed or flashing.

In order to avoid confusion, all other use of red, green or amber lights, so located that they may be mistaken for traffic signals, the committee believes should be discontinued.

In some instances, due to the expense involved, traffic control signals are not placed at every intersection on a street where traffic control is desirable. Such a plan is not the most effective and should be considered only as a temporary one, intermediate signals being installed as soon as the finances permit. Until the system is completed, however, some plan should be adopted to prevent traffic from massing at the intersections where the signals are in operation and to inform traffic in cross streets of its approach to a signal-controlled street.

One of the most difficult and at the same time one of the most important problems in regulating traffic is the matter of turns, particularly left turns. Naturally, in the absence of any standard code, many different methods for solving the problem have been adopted based on strictly local conditions. They may be entirely satisfactory so far as local traffic is concerned, but there is now so much long-distance and intercommunity traffic that standardization has become highly desirable, if not absolutely necessary.

The replies to the questionnaire indicate that at least nine different methods are used in New York State alone for making turns at intersections where traffic is regulated by traffic control signals. The committee feels that purely local conditions should not be permitted to govern regulations affecting turns, but rather that all municipalities should adopt similar regulations on this point. The problem, therefore, is to discover the methods or rules which, on account of their logic, will appeal to the motorist and which will be most generally satisfactory and effective in reducing accident hazards and facilitating the movement of traffic.

Left turns interfere with and are dangerous to both vehicular and pedestrian traffic. Right turns may retard vehicular traffic, but are hazardous chiefly to pedestrians.

As far as is physically possible, drivers wishing to make a right turn should be encouraged to keep near the right curb; those planning a left turn should keep near the center of the street, and those wishing to go straight ahead should stay between these two lines. Some cities have found it advisable to indicate these three traffic lanes by markings on the street surface where the street is of sufficient width. In the majority of cases found in the congested areas of cities, the width of the street will permit of only two lines of vehicular traffic in one direction. Even here, however, drivers should keep near the side of the driving space toward which they wish to turn.

The left turn, where the corner is "cut," produces one of the most hazardous conditions at an intersection. Vehicles making such a turn intersect other lines of moving vehicles at dangerous angles and approach pedestrians from unexpected positions. In the opinion of the committee all left-hand turns should be made to the left of the center of the intersection. If, on the other hand, traffic were to follow a course to the right of the intersection it would twice intersect traffic.

If a red light is to be interpreted as an order to stop, and a green light as a permit to proceed, these meanings, to be consistent, should apply whether traffic is to proceed straight ahead or is about to make a turn. To specify that a driver wishing to make either a left or right turn should stop on green light and proceed on the red is inconsistent and tends toward confusion.

PEDESTRIANS MUST BE PROTECTED

The committee feels that no traffic signal system is complete unless in addition to preventing traffic accidents and congestion it also affords adequate protection to the pedestrian. It is the natural tendency of persons on foot to cross an intersection whenever an opportunity affords. It is difficult to control pedestrian traffic by signals. It would seem preferable, therefore, to provide opportunities for crossings by the use of signals to motorists, and to permit the movement of pedestrians only in conformity with the movement of vehicles. Pedestrians should be permitted to cross an intersection only in the direction of moving traffic or when all traffic is halted. This can be accomplished by local ordinance supplemented by education.

In recommending the use of only two colors, namely, red and green, in traffic control signals, the committee fully appreciated the need of an interval between the movement of traffic in one street and that in the cross street. This is essential in order that vehicles, and particularly pedestrians who have started to cross an intersection, as directed by a green light, may reach the opposite side before the traffic from the intersecting street is permitted to move. It is felt that in many instances this interval is of insufficient length to provide for the safety of pedestrians. It is the opinion of the committee that this interval should not be designated by the use of any additional color, such as amber, as there is a tendency on the part of drivers to take advantage of the change by speeding across an intersection or by slipping ahead into it, prior to an authorized change of traffic movements. This defeats the purpose of the interval and creates an unnecessary hazard, particularly where pedestrians are involved. It is felt that if the red light is shown in all four directions during the interval, this tendency and the resulting hazard would largely be overcome. It has been suggested that the application of this plan to certain existing signal systems would involve some expense and that an alternative arrangement be made whereby the red light would overlap the green during the clearance interval. The committee feels that such an arrangement would produce the same conditions as are now produced by the amber light and therefore would be unsatisfactory. It further feels that the expense involved of showing red lights in all four directions would be thoroughly justified by the additional safety secured.

It is impossible to suggest a standardization for the location of traffic control signals, as local street conditions and available finances will, of course, govern the actual layout. The committee, however, has considered the various methods in use at the present time and has listed three outstanding plans of installation at an intersection. These are given in the order which the committee feels should be given precedence.

1. Four lights, one on each corner, each light showing only in one direction, the controlling light in each case being the one on the far right corner to approaching traffic.

2. Two lights placed on diagonally opposite corners, each one showing in two directions.

3. One light located on one corner and showing in four directions.

The purpose of automatic traffic signals is twofold—to expedite traffic movement, not to hamper it, and to minimize accident hazards at intersections. All automatic signals, however, enforce the stoppage of one line of moving vehicles while the line on the intersecting street is proceeding. This period of delay should be less than would be caused under normal conditions if the traffic at the intersection was not regulated or the delay should be offset by a greater ease and safety of movement. Unless one or both of these conditions is produced, the delay is unwarranted. In other words, no automatic traffic signals should be installed unless they are essential. Furthermore, they should not be operated during hours of the day when traffic will move effectively at the given intersection without the signal. A traffic count made on several days and under varying conditions will provide an excellent guide as to the periods when each should be in operation.

ADJUSTING SIGNALS TO LOCAL CONDITIONS

It is frequently advisable to install an automatic traffic signal at an intersection of two streets that do not carry an equal flow of traffic or where the proportion of traffic on one street as compared with that on the other differs considerably at different hours of the day. At such places full consideration should be given to the relative flow of traffic in the two intersecting streets and the automatic traffic signal timed accordingly. For instance, if the normal traffic in a north and south street is twice as heavy as that in an east and west street, twice as long a period should be permitted by the signal for the movement of the north and south traffic. It may be necessary to change this timing interval at certain hours of the day to satisfy the changing conditions resulting from "rush hour" movement. The exceptional conditions at some heavy traffic intersections in New York City have made it necessary during certain "rush hours" to surplant temporarily the traffic signal by a police officer, who has authority to regulate traffic in accordance with immediate requirements, regardless of the signal. The more flexible the system the more effective it will be and the greater approval it will receive from the traveling public.

There seems to be a generally accepted principle that some interval should be allowed between the flashing of the red and the green signal. The purpose of this interval is not so much a warning of the impending change as it is to permit of a clearance of the intersection before such a change. As mentioned before, there is a tendency to indicate this period by overlapping the red signal on the green. This plan the committee disapproves, preferring the use of red lights in all four directions. The time of this clearance period should be sufficient to permit vehicles and pedestrians which have entered an intersection to reach the opposite side before the direction of traffic is changed. If the period is longer, unnecessary delay will be caused. If shorter, an accident hazard and a confusion of traffic will result.

The principles just outlined are fundamental to all traffic signal installations. The application of these principles is dependent on local conditions and local design. Although the practices followed in the operation of traffic signals are changing constantly as new and better methods are devised, those in use at the present time may be grouped under four general headings:

Individual Operation.

Synchronized System.

Progressive System ("Wave," "Platoon" or "Staggered").

Wherever the control or traffic of one intersection affects the movement of traffic at another controlled intersection some plan of co-ordination should be developed. Otherwise, unnecessary delays and crowding will result. Furthermore, the vehicles released at one intersection may just reach the next controlled one as the red light flashes on, thus forcing a stoppage. This is contrary to the principle of automatic lights that were designed to facilitate the movement of traffic and not to halt it unnecessarily.

SYNCHRONIZED PLAN IS SIMPLEST

The simplest method of co-ordination is the synchronized plan used originally in New York City. In accordance with it a number of signals are operated together as a unit. For instance, all the signals in the system will show red in the same direction at the same time and will be changed simultaneously. This permits of a north and south movement throughout the controlled section, while east and west movement is halted. Under the synchronized system the relative quantity of traffic or intersecting streets at a given intersection cannot govern the timing of the individual signal, but the relative flow of north and south traffic as compared with that of the east and west traffic throughout the area must be used to govern the timing of the entire system. Provision should be made for breaking the synchronized system into small units for emergency operation, and a hand-operated device should be installed at each signal.

WAVE PLAN PERMITS CONTINUOUS MOVEMENT

When the synchronized system is used all vehicles are forced to stop at least once during the change of signals. The progressive system sometimes called the "wave," "platoon" or "staggered" system and successfully operated on Sixteenth Street in Washington, D. C., was designed to overcome as far as possible this necessity for stopping. In accordance with it, all signals in the system are changed simultaneously, but they are grouped as to the color displayed.

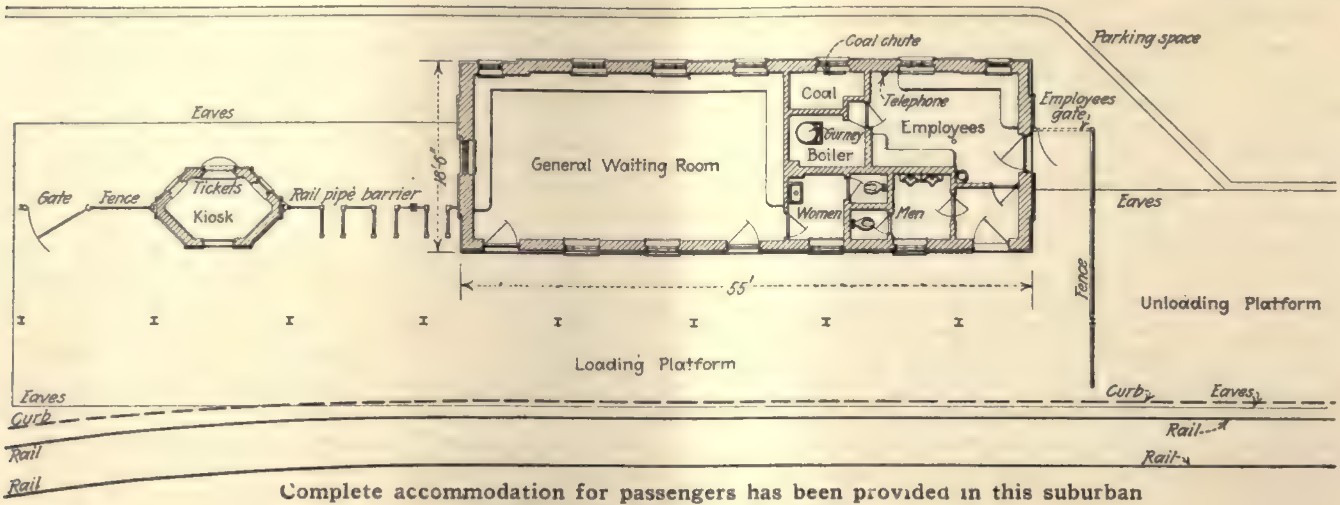
This plan permits of approximately continuous movement of traffic in both directions while at the same time it discourages speeding, as the speeder would be halted at nearly every intersection. The progressive system is most effective on a wide thoroughfare where blocks are of equal length. Where they are not, a varying number of blocks may be grouped in such a way that the driving distance of each group is approximately the same.

No consideration can be given under the progressive system to the relative flow of traffic, either in individual intersecting streets or by direction, considering the entire controlled area as a unit. On the other hand, the period permitted for the red and green lights must be of equal duration. In cities where a predominance of traffic is in one direction this works a rather serious handicap, particularly if the system covers more than one through street. The co-ordinated system being successfully used in the Loop district of Chicago was designed to overcome this difficulty and provide a system which, as far as practicable, would take into account local conditions at intersections and time of travel between the same. Each signal may be changed at a different time, but unlike the individual method of operation, the changing of all signals is co-ordinated. Similar to the progressive plan it provides for an approximately continuous movement of vehicles not exceeding the speed limit.

CO-ORDINATED SYSTEM IS MOST FLEXIBLE

The co-ordinated method of traffic control is one of the most flexible systems yet devised. This method, with the auxiliary apparatus required, may, however, most satisfactorily serve special traffic conditions. The co-ordination of traffic may be secured in two ways, either by central control or by the use of individual motors of a synchronous type.

In operating it a given intersection is selected as a starting point and the proper timing of its signal is determined. The next intersection is considered in like manner, but its cycle of changes is started a sufficient time after the start of the cycle at the basic intersection to permit vehicles to move from one to the other, considering speed limitations and conditions of travel. The same plan is then applied to each intersection of the selected street within the controlled area and is subsequently applied to parallel streets, taking into full consideration the result and effect on cross streets. Certain allowances will be found necessary in order to co-ordinate the system for the entire area, but the resulting ease of movement in the section as a whole should offset the disadvantages of these particular allowances.



Complete accommodation for passengers has been provided in this suburban station of the Montreal Tramways

Montreal Tramways Installs Modern Suburban Station

ONE of the improvements recently made by the Montreal Tramways is a loading platform and station at the terminus of the Cartierville line, in the Parish of St. Laurent, on the island of Montreal. The former town of Cartierville is situated on the Rivière des Prairies, or what is locally known as "Back River," on the island of Montreal, and is now comprised in the area of the city of Montreal. The station is located on the Gouin Boulevard at a distance of 11.7 miles from the center of the city.

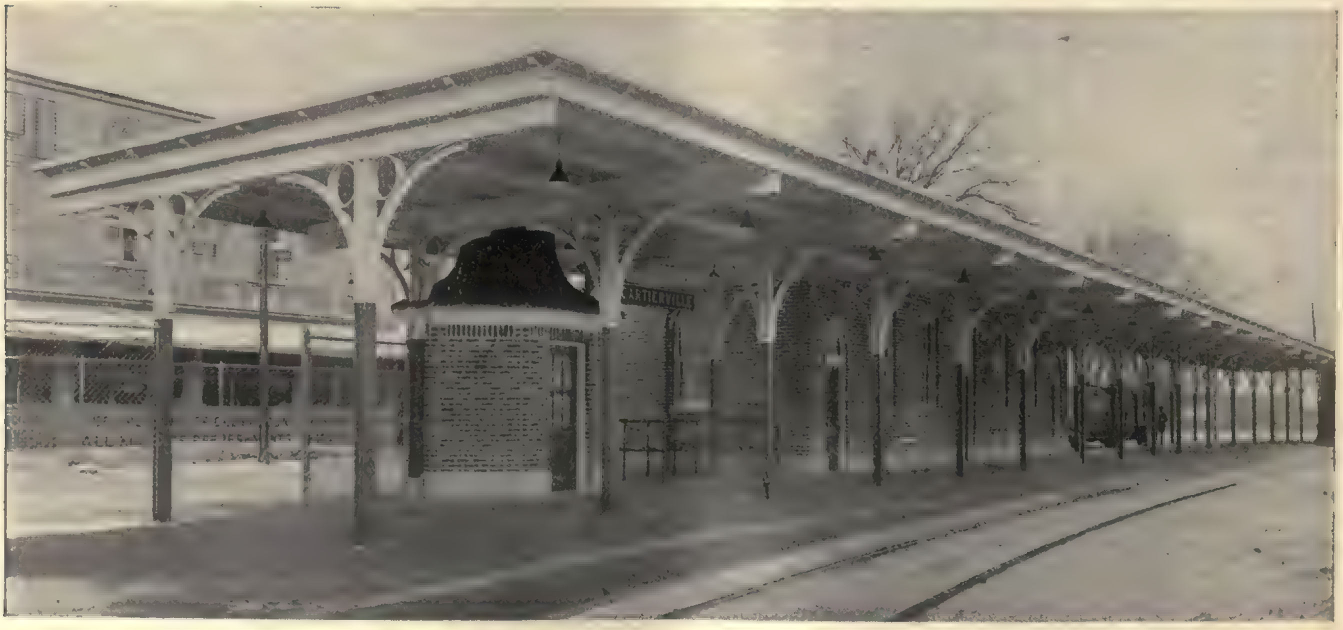
The building, situated between Ranger Street and the company's right-of-way, consists of a station and kiosk, both of rustic brick on Montreal limestone base and concrete foundation, with stone trimmings of Bedford limestone and flat center drainage roof of tar and gravel laid on gypsum slab.

The station, which is a one-story building about 55 ft. x 18 ft. 6 in., contains a waiting room, 30 ft. x 16 ft.; employees' room and conveniences for employees and public. It is heated by a hot water furnace.

The kiosk is used for the sale of tickets when the station is operated on the prepayment plan. It is used for the most part in summer, when the park and other features cause a congestion in this locality. The average number handled on Sundays and holidays during the summer months is between 25,000 and 30,000 people per day, the bulk of the traffic being in the afternoon and evening.

The platform has an average width of 22 ft. on the unloading side and 38 ft. on the loading side, with an asphalt floor laid on a 4-in. concrete slab on cinder foundation. It is covered with a center-drained roof supported on steel posts and I-beams, the roof being covered with "Armco" iron. A Paige wire fence divides the platform into two parts, the narrow part being used for unloading, the wider part, with gates, etc., being used for loading.

At the rear of the station, connecting Ranger Street with the right-of-way of the company and forming a loop with Gouin Boulevard, is a driveway paved with scoria block, for the use of motor buses, public vehicles and the like. It also provides parking space for taxis.



This attractive suburban station was built by the Montreal Tramways to provide shelter for passengers at Cartierville. It can be operated on the prepayment plan when desired

Standard two-car train operated by the Rome Tramways

Transportation in the Eternal City

Rome's hills and narrow streets in the downtown section complicate its transportation problem. Some favorable conditions are present and the trolley cars are carrying the bulk of the traffic

By Henry W. Blake

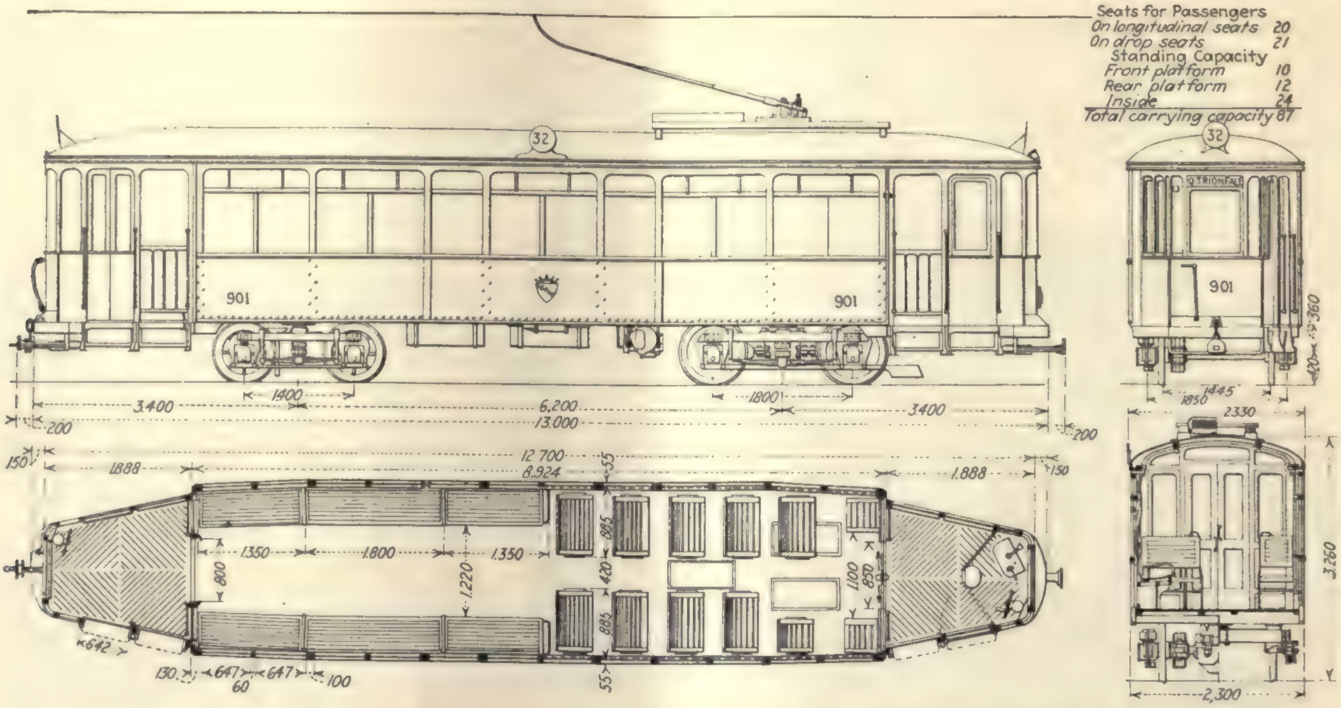
Senior Editor Electric Railway Journal

IN ROME, Italy, the main transportation problem is not different from that in American cities, namely, that of getting vehicles through the central district quickly. Conditions surrounding this problem in Rome, however, differ considerably from those in the average American city of like population. Some of these circumstances are more favorable to a solution, others less so. The less favorable circumstances will be considered first.

Chief of these is the narrowness and crookedness of the streets in the central portion of the city. In its newer portions, Rome has broad avenues and boulevards, often with a reservation in the middle or on one side for the car tracks, but in the center of the city streets are 25 ft. and 30 ft. wide, often with sidewalks only 24 in. wide. Some important streets even have no sidewalks. Most of the car line streets in downtown Rome are so narrow as to permit only one line of traffic in each direction. Thus, the Via Due Macelli, which leads into the important Piazza Di Spagna, has two tracks and is one of the three or four heaviest car traffic lines in the city, yet measures only about 8 m. (26 ft. 3 in.) from house line to house line.

Besides being narrow, most of the streets in the older parts of Rome, where the principal business district is located, are quite crooked, so that sharp curves in the electric railway track abound. At such points the head of the rail sometimes has to be laid within 36 to 40 in. of the house corner, so that at such places it would be somewhat dangerous for a person to stand while a car is passing. Finally, Rome is a city of hills, of which there are seven altogether. This means many steep grades with curves.

These handicaps to electric railway operations are undoubtedly great. There are, however, several favorable conditions. One is the comparatively small amount of other street traffic, except pedestrians. Automobiles, of course, are far less numerous in Europe than in the



Side view and plan, cross-section and end view of double-truck car now being built

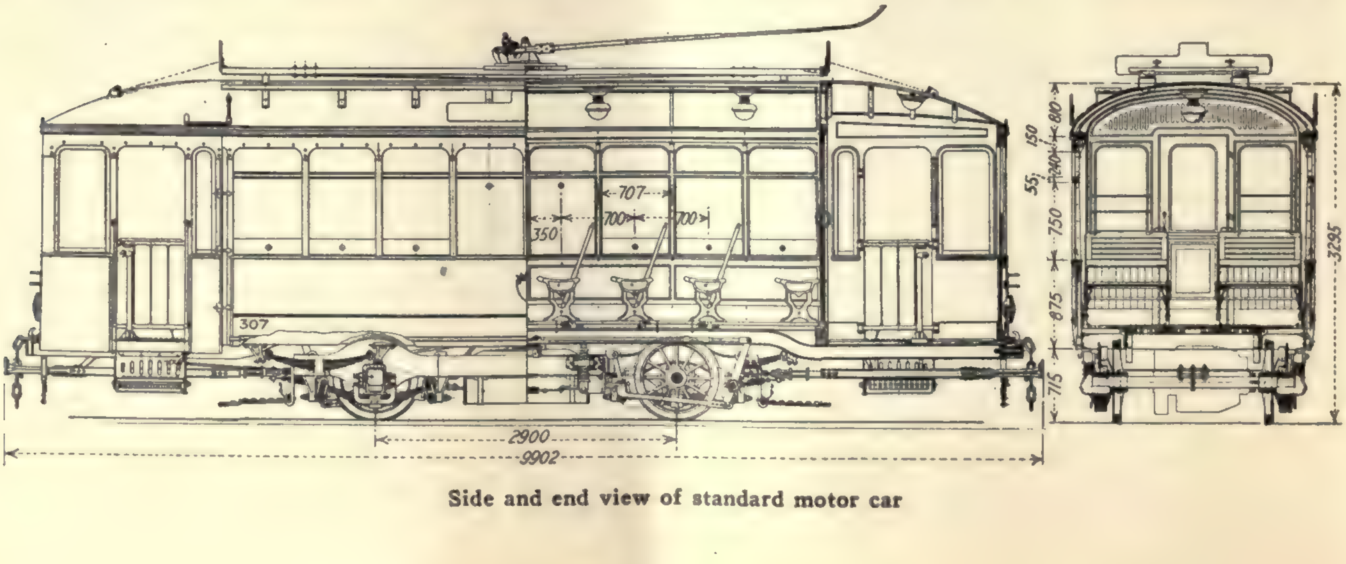
United States. Horse-drawn and auto taxicabs are present, with some private cars, but, as a whole, the vehicular traffic is much less dense than in cities of the same size in the United States. What there is of it besides the electric cars keeps as much as possible on the streets which have no car lines, or, at least, it keeps away from the narrow streets which have car lines. Fortunately, there are several broad thoroughfares of this kind through Rome. Traffic policemen are not much needed, and they are a comparative rarity.

Another favorable circumstance is a comparatively long spacing of car stops. This spacing averages 250 m. (835 ft.) in the center of the city and from 300 m. to 400 m. (1,000 ft. to 1,335 ft.) in the outskirts. This permits a fairly good schedule speed (about 12 km. per hour or 8½ m.p.h.) for cars within the city limits. Still another good condition is the favorable ordinances affecting electric railway operation.

The comparative absence of rush-hour and slack-hour traffic conditions such as exist on electric railways in cities of corresponding size in the United States is helpful to tramway operation. A more exact way of stating this circumstance perhaps would be to say that there are four rush-hour periods instead of two. As in many other cities in continental Europe ordinary business largely ceases during the noon lunch period. At this time most of the downtown offices as well as the stores (with the occasional exception of a large department store) are closed. The doors are locked, the shutters are put up and customers are not expected until the afternoon opening hour. The period of lunch varies from one to two hours. It begins at from 12 to 12:30 and ends at from 1:30 to 2:30 p.m. Rome is not alone in this custom, as has already been explained. It is followed also in Paris, Milan and other cities.

As most of the persons thus released from business go home to lunch (if not living too far away) the four peaks of the tramways can be understood. In consequence, largely the same headways are followed by the tramcars throughout the day and there is a very much larger proportion of straight runs for the men than in the United States.

Incidentally the explanation should be made that while the offices and stores close for a considerable period for



Side and end view of standard motor car

déjeuner la fourchette, they work later in the afternoon than is customary in most American cities, i.e., the offices remain open until 7 or 7:30 p.m.

Hence, the railway system is able to offer good urban transportation, while its low fares and the many steep hills in the city are reasons for attracting passengers to its lines. Table I gives passengers carried during the six years 1920-1925 inclusive, nearly all of the lines being within the city limits.

TABLE I—PASSENGERS CARRIED ON ROME TRAMWAYS SYSTEM

Year	Total	Per Motor Car-Km.*	Per Motor Car-Mile*
1920	140,696,992	11.368	7.105
1921	139,562,222	9.280	5.800
1922	144,233,975	7.568	4.455
1923	154,164,622	7.684	4.5554
1924	150,663,079	6.971	4.357
1925	186,635,463	7.129	4.456

* Based on one trail car-mile being equal to one-half a motor car-mile. This is the general European method of calculation.

TYPE OF CAR USED

At present the Rome system has a total of 400 motor cars and 267 trailers. Standard types of car used are shown in accompanying illustrations. Both motor cars and trail cars are mounted on single trucks. Elevation and section drawings also are shown. The seating arrangement varies in different cars. In the type illustrated, there are cross seats for two passengers each on both sides of the center aisle, although a large number of the cars, perhaps most of them, seat only three passengers across the car. With all seats except the four end seats holding two passengers each, the seating capacity of the car would be 28 passengers. With a row of single seats on one side of the car, its seating capacity would be 24. Slat seats are used.

The remainder of the equipment includes a bow trolley, Westinghouse air brake with axle compressor, hand brake and short circuiting brake, two 40-kw. (53-hp.) motors and General Electric B-54-M controller. The starting resistance is on the roof. Completely equipped this car weighs about 14 metric tons (30,800 lb.).

The city is having two double-truck cars built for experimental use at the works of Carminati & Toselli, Milan. Plans and elevations of these two cars are shown in accompanying drawings. They seat 41 passengers each, and each has a nominal standing capacity for 46 passengers in addition. The front truck is equipped with two motors. The other is idle. The total weight is 15 metric tons (33,060 lb.), of which 9½ tons (20,940 lb.) is on the motor truck. Both cars are equipped with air brakes, and one with regenerative braking. The latter type was included primarily for safety and not for economy of current.

The wheels on both the present standard and the new cars are 800 mm. (31½ in.) in diameter, making a rather high two-step entrance and exit.

In the present standard single-truck car, the platform entrances on both sides are inclosed by hinged gates with interconnected folding steps. On the devil-strip side these gates are kept down, but in practice the gates on the curb side of the car are always kept open. In the double-truck car there are extra doors on both front and rear platforms. These doors are normally kept closed, but can be opened in case of heavy loading or unloading.

The exterior of the car is attractively painted a cardinal red on side panels and sash, with brownish yellow trimming. The crest of the city with the letters S.P.Q.R. (*Senatus Populus que Romanus*) appears in the center of the side panel.

The standard single-truck trail cars are similar in seating arrangement and general design to the single-truck motor cars. Not every motor car hauls a trailer. During 1925 there were about twice as many motor car kilometers run as trail kilometers, the figures respectively being 20,969,018 and 10,421,462. In Table I the method followed for calculating total ton-kilometers (or ton-miles) is the conventional one generally followed in Europe of including only one-half of the trail car-miles, on the theory that in cost one motor car-mile is about equal to two trail car-miles.

Rome Tramways has ordered 30 buses of this type for feeder service

BUSES USED IN FEEDER SERVICE

The Rome tramway system also has on order 30 buses of the type shown in an accompanying sketch. Fifteen of these buses will have seats for 28 passengers and standing room for 32. The other fifteen will be somewhat smaller, having seats for 22 passengers and standing room for 28.

These buses will be put to two uses. One will be as tramway feeders in sections of the city which do not yet have enough business for car lines. The other will be on lines where the car routing has had to be changed because of street congestion. Here buses will be used partly as substitutes for cars which have been rerouted through another street, but the length of run made by the buses will be much shorter than that of the former car line and no transfers will be given. Bus operation is regarded as considerably higher in cost per vehicle-mile

Indicator to tell passengers which car will next leave the terminal is operated electrically by the dispatcher

than car operation and the proportional difference is probably substantially greater than in the United States.

Up to the present no buses have been in operation by the Rome Tramways. There are in the city, however, about 24 storage-battery buses, operated by a private company, the Societa Anonima Transporti Ugolini. These buses have been in service about three years and are run on streets not occupied by car lines. These include the Corso Umberto I, the most fashionable shopping street in Rome. The routes over which these storage battery buses are used are fairly level, a rare condition in Rome.

SPACING AND NUMBER OF STOPS

The Rome Tramways has accomplished a great deal in the way of merchandising transportation. This work has been in charge of the traffic department. Part of its efforts has been given to increasing the schedule speed of cars by cutting out what the management believed to be unnecessary stops. This naturally met considerable opposition from interested parties anxious to have certain stops continued. But as a result of two years of effort 72 stops were discontinued and many others were more scientifically located. As a result the management believes that of its present 300-odd stopping places, more than 250 are rationally placed. The time of stops is shortened by the large number of island platforms for waiting passengers which have been installed in Rome.

ROUTES DESIGNATED BY NUMBERS

So much effort has been made in Europe toward identifying car routes by numbers and of advertising them by these numbers to the public that particulars will be given of the practice in Rome which has perhaps gone further in this direction than in most other European cities. In the first place, every car carries its route number and lettering showing the route termini conspicuously on head signs and also on signs at the sides of the car roof, as shown in the views of the car exteriors. The head signs are illuminated at night. Two disks inside the car with the route numbers in white on a black background are also being tried in some of the cars, to determine how useful this information will be.

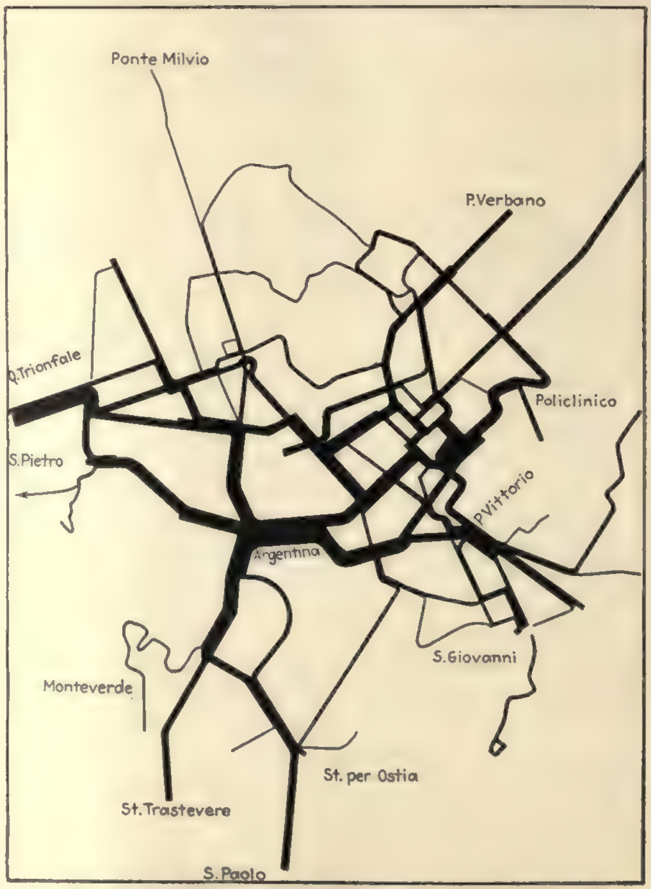
Each car carries in its right-hand front window and left-hand rear window a poster giving a list of the principal streets and the route termini, the latter being printed in red. These posters are duplicated, back to back, so that they can be read either from the inside or the outside of the car. A direction sign is carried in the left-hand window of the front vestibule with an arrow pointing to the terminus toward which the car is going. On the Piazza Colonna-Piazza S. Choce line, for example, the sign would show the arrow pointing to Piazza Colonna if the car was going in that direction and to the S. Choce terminal if the car was going in the reverse direction.

The numeral sign on a belt line car is surmounted by an arrow pointing to the right or left, depending on whether the car circles the city in a right-hand or left-hand direction. Not all of the plans outlined have been installed on every car, but all are on some cars for trial.

ADVERTISING THE ROUTES BY NUMBER

Distinguishing route signs would be of little value if the riding public were not taught to identify the various routes by these numbers. Passengers are helped to do this in several ways.

One is by the information published in route racks erected at stopping points. All routes stopping at any



Traffic flow diagram showing cars and trains for the maximum hour during January, 1927 particular point are listed by number in these racks and a short description is given opposite the number of each route. This system of marking car stops is a comparatively new one, and not all of the stops are so identified as yet.

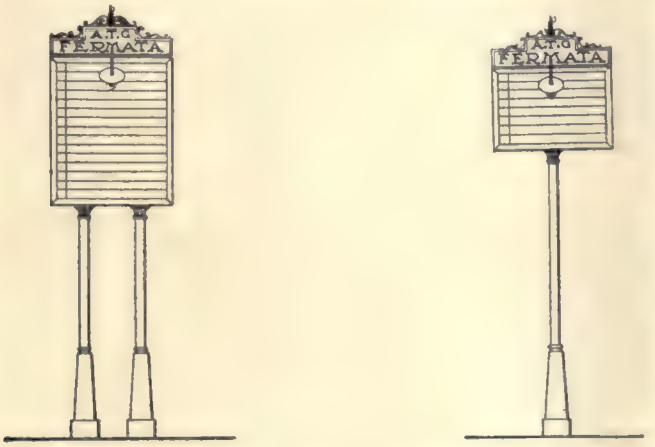
Besides these methods the plan customary throughout Italy is also followed. This is to hang from the span wire at a car stop a metal sign reading "Fermata." The letters are in black against a white background and are so large that the signs can be read for a considerable distance away. On the whole this plan seems more positive and satisfactory than that of placing a stripe or two stripes on an adjoining trolley pole. The stripe convention may signify a stop to a stranger or it may not. He is never quite sure.

Another method of familiarizing the riding public with the route numbers is by a "tramway guide." Such a handbook containing a list of the various routes and other helpful information such as length of route, headway, etc., is published and sold to the public for a small sum. This handbook contains two excellent maps of Rome on one side of the sheet in colors with the most important buildings and other points listed in red, while the map on the other side is printed in light gray ink, and over it is printed in red a chart of all the car routes with their distinguishing numbers.

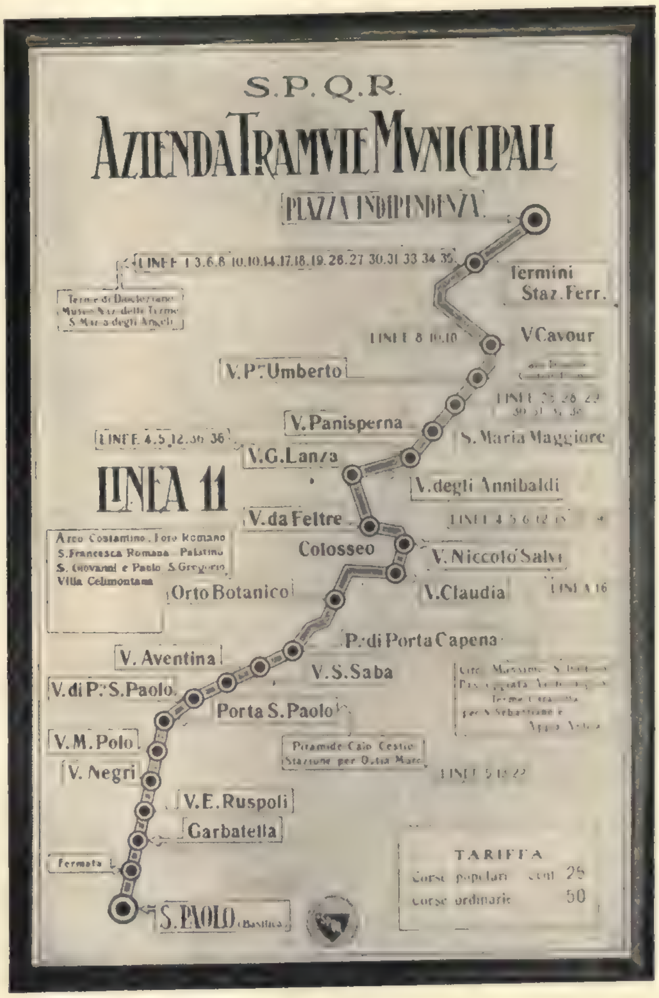
It would be difficult to overemphasize the value as a traffic promoter of these methods of advertising the different routes. The practice has become so accepted that residents of Rome come to know just what routes to take for desired journeys, and the tourist can quickly obtain and absorb the same information. In fact, the standard guide book tells the tourist which route by number he needs to take him to any desired point, and the larger guide books contain maps of the routes by number.

The practice described is not unique in Rome, as several cities in Italy have similar systems, though not worked out as completely.

A number of other transportation improvements were noted during a recent visit to the Rome system. One was a clever indicator to show to waiting patrons which car will be the next to leave a stub terminal. This point, Piazza San Silvestro, is at present the terminal of three lines, Nos. 8, 10 and 43. The dial shown in the view is marked with these three numbers and the hand is moved from one number to another electrically by a starter whose booth is located at the terminal. This hand shows the number of the route for which the next car will leave.



A feature of the merchandising of transportation in Rome is the method of marking stops and listing the routes passing that point. The rack is illuminated at night



A chart of this kind has been prepared for each route showing all stopping points and connections with other lines

The number of electrically operated track switches now in Rome is being constantly increased, in spite of the comparatively low cost of labor in Italy. On Jan. 1, 1926, there were 26 such switches on the system. Light signals to warn other vehicles of an approaching electric car have been installed at a number of curves or other points where the view ahead is obscured by intervening buildings. These signals are not greatly different in principle from the automatic type of warning signal used at grade crossings of steam railroads in America and carry the words on an illuminated dial: "Attenti al Tram," or "look out for the street car." They are unusual because in Rome they are used exclusively in city tramway service at sharp corners.

Several covered waiting stations have been erected. A number of headway recorders have been installed at different strategic points.

ONE-MAN OPERATION BEING TRIED

As yet only a belt line in the suburb of Monte Sacro uses one-man operation. On all other lines a conductor is used on each car, and this means of course two conductors on a two-car train. In retaining two-man operation Rome does not differ from most other electric railway systems in Europe. Among the reasons which have impelled Rome to continue this practice the following may be mentioned.

TABLE II—YEARLY WAGES PAID BY THE ROME TRAMWAYS

Class of Employee	Number Employed on Dec. 31, 1925	Basic Yearly Wage Lire	Basic Yearly Wage Dollars	Increase in Yearly Wage Made Every Two Years (Limited to Five Periods or Total of Nineteen Years Lire	Increase in Yearly Wage Made Every Two Years (Limited to Five Periods or Total of Nineteen Years Dollars
Inspectors, instructors, etc.	90	12,500	567	380	17
Motormen	737	19,800	491	320	14
Conductors	1,032	9,300	423	280	13
Carhouse helpers, track men, etc.	115	7,900	359	250	11

Note:—On the basis of 22 lire to the dollar.

1. Labor cost is much less than in the United States so that the saving from one-man operation is not so great. The wages paid the four principal classes of transportation employees in Rome is given in Table II. These figures are given on a yearly basis, as that is the basis of the five-year contract made between the management and the men on Dec. 15, 1923, to continue through 1928. The hours per week are 52, and in addition to the wages paid a certain part of their uniforms is given to the men without charge, the amount depending on the years of service.

Island platforms are used extensively in Rome. The one shown here is located in front of a principal railroad station

2. A second reason given for the continuance of two-man operation is the low speed of the cars and the non-use of platform gates. The Rome Tramways has notices requesting passengers to board cars by the rear platforms and leave by the front platforms, as well as notices forbidding passengers to board or leave cars while in motion. Both rules are disregarded, especially that requiring cars to be boarded by the rear platform. This makes hand fare collection almost obligatory.

3. A final reason for the retention of the conductor is the system of fare collection employed. This is the common European plan of issuing fare receipts torn serially from a pad. However, as most of the Rome system is now on a flat fare basis of 50 centessimi on week days and 60 centessimi on Sundays, it would seem that prepayment could be used if this were the only objection to it. That this is not impossible is shown by the fact that the Rome management is now considering the use of portable fare registers instead of the pad system.

The disadvantages of the latter are great. Its use means not only that the car is littered with used receipts discarded by passengers, but the plan is expensive in stationary and in the employment of inspectors who board the cars to see if all passengers have paid their fares. Also, it is more subject to abuse by both passengers and conductors than a fare box or a register with hand collection.

Before starting its single one-man car line the management issued an extended schedule of instructions to passengers. Among them is noted the rule that passengers are requested to offer to the one-man operator the correct fare when boarding, and that the operator has the right to refuse admittance to the car to all persons who do not present the exact fare.

SYSTEM IS OPERATED BY MUNICIPALITY

The present owner and operator of the Rome Tramways system (with the exception of one line) is the city of Rome, the management being intrusted to a board known as Azienda delle Tramvie del Governorato di Roma. Municipal operation was begun in 1911, when the city started service on several lines, in addition to those which were then being operated by a private company—Societa Romana Tramways-Omnibus. Gradually the lines of this company (with the exception of No. 16) were absorbed by the municipality, the greater part being taken over in 1919.

The single line not yet taken over (No. 16) is an important route. In addition the company owns a street railway tunnel under the Quirinal Hill, which is used by line 16 and also by a number of the municipal routes. The franchise for this tunnel and for line 16 does not expire until 1940. It is quite probable that the city will acquire both tunnel and line before that time by purchase.

RAPID TRANSIT NEEDED

An accompanying traffic flow diagram shows the need of some relief to the tramway system in the way of rapid transit. The through arteries are few and are now considerably congested. They will become more so as motor car traffic in the streets increases, as it is certain to do. Some relief could be gained by a tunnel under the Capitoline Hill, but eventually Rome will have to have some sort of rapid transit system like other large national capitals. This condition is realized by the city authorities and a commission has been appointed to consider plans. At present a north-and-south line and an east-and-west line are proposed, and shafts are being sunk at different points to determine the nature of the subsoil. Trains of five cars are being considered for the first installation. The project would be financed by the city with some assistance from the national government.

Momentary Stresses Developed While Bucking Railway Motors

A maximum torque fourteen times the full load value may occur under certain conditions. High current peaks may result in cracked shafts and pinions or other mechanical damage to a motor

By L. M. Aspinwall
Railway Equipment Engineer
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

MAXIMUM sustained stresses in electric railway motor armatures, shafts and gears are limited by the slipping point of the wheels on the rail, but, unfortunately, the momentary stresses are not so safeguarded. The force required to accelerate or retard any given mass is directly proportional to the rate of change in velocity. Therefore, a sufficiently rapid change in the velocity of the rotating parts will cause the corresponding forces to assume tremendous magnitude. There is, of course, nothing new in this statement of a simple fundamental law of physics, but we wish to emphasize it, as the following discussion deals with momentary stresses produced by sudden changes in velocity.

Theoretically, the torque which can be developed by a series type railway motor is limited only by the current which can be passed through the motor. The current, in turn, is limited by the impressed voltage, time of application, motor resistance, counter emf., inductive emf., flash-over point and safety cutout devices. It is perfectly possible, under certain conditions in actual practice, for the current to reach such momentary values as will produce stresses far in excess of the slipping point of the wheels.

In the following discussion particular consideration is given to the conditions produced when motors are "bucked" at various car speeds and the possible stresses to which axles and gears may be subjected under these conditions. In general, those familiar with railway work understand what is meant by bucking the motors, but as this term is sometimes erroneously used a few words of explanation here will probably not be amiss.

Assuming a car to be running away with power off the line or the circuit breaker open, bucking is accomplished on a four-motor equipment by merely throwing the reverser, and on a two-motor equipment by reversing and moving the controller handle up to any one of the parallel notches. Under these conditions the motors immediately pick up as generators, the two motors which are in parallel generating voltages which are in opposition, and as the characteristics of the two machines are never exactly matched, one quickly overcomes the voltage of the other and reverses its field. The two machines are then generating in series through a circuit consisting of the resistance of their fields, armatures and the connecting wiring.

Bucking should only be used as a last resort in cases of emergency where all other means of stopping the car have failed. If the car speed is sufficiently high the current rises quickly to a point where one or both pairs of wheels slip. If both pairs of wheels slip the current drops quickly to a value where the wheels again take hold. The current then rises until the wheels again slip, and this cycle is repeated with great rapidity, producing a series of jerks, which action is responsible for the origin of the term bucking.

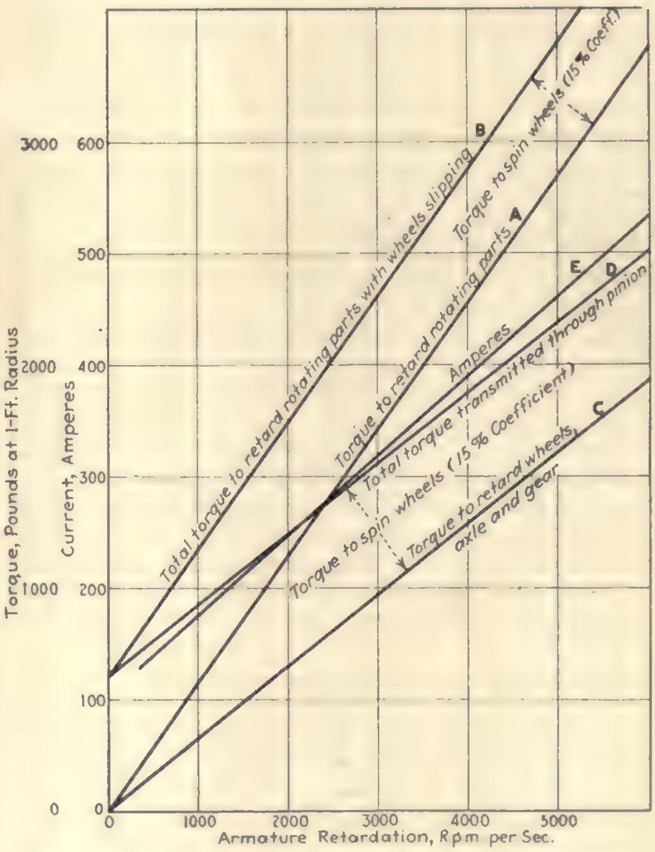


Fig. 1—Torque and current relations in retardation of armature, wheels and axle

Curves are for a quadruple equipment of Westinghouse 532-B motors with 17:67 gear ratio and 33-in. wheels. The load is 5.75 tons per motor and the adhesion 15 per cent with wheels slipping.

Frequently only one pair of wheels slips and this pair is locked or driven in the reverse direction by the current generated from the motor, which is still rotating in the same direction as the car motion.

In some cases cars have been wired with what is known as a loop circuit in order that this emergency

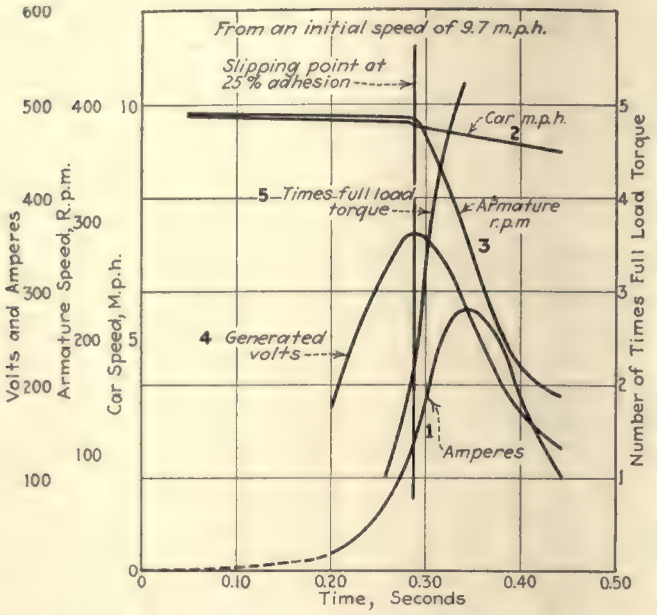


Fig. 2—Transient conditions during period of bucking for motor with characteristics given in Fig. 1

The total resistance of the loop circuit is 0.9375 ohm. The motors were bucked from an initial speed of 9.7 m.p.h., giving the ampere curve 1 as recorded in an oscillogram. The other curves were calculated from curve 1 and available data.

feature of bucking could be used with less erratic results. The loop circuit consists merely of a connection which is established across the terminals of the motors during bucking, so that the two motors generate in parallel through this path.

The Westinghouse 532-B motor was selected for the purpose of this analyzation for the reason that oscillograms were available which were taken on this motor under bucking conditions, with loop connections, and formed a basis for calculations and check.

The first step in this study was to calculate the forces necessary to accelerate, or retard, the component rotating parts, such as armature, wheels, gears and axle, assuming a 17:67 gear ratio and 33-in. wheels. The result of these calculations has been plotted in Fig. 1. Curve *A* on this graph shows the total torque required at the armature to retard the armature, plus the wheels, axle and gear at various rates expressed in armature r.p.m. Curve *C* shows the torque necessary to retard the wheels, axle and gear only and is, in general, the curve in which we are particularly interested, as this curve, plus the torque necessary to slip the wheels, shows the total torque transmitted through the armature shaft and pinion.

In the case under consideration a weight of 11,500 lb. was assumed on each axle, and to spin the wheels at 15 per cent adhesion required 1,720 lb. tractive effort, or a torque of approximately 600 lb. at 1 ft. radius on the armature shaft.

Curve *B* is plotted 600 lb. above curve *A* and shows, therefore, the total torque required to spin the wheels at 15 per cent adhesion and to retard the total rotating parts at various rates. The approximate current necessary to produce this torque is shown by curve *E*, the values for which, above 150 amp., were obtained by extrapolating the normal torque curve of the 532-B motor.

It should be noted particularly that with a high current, say 500 amp., the torque necessary to spin the wheels, which is indicated by the vertical distance between curves *A* and *B*, is a small portion of that required to retard the rotating parts and is not, therefore, a limiting factor.

Curve *D* shows the torque necessary to spin the wheels with 15 per cent adhesion and to retard the wheels, axle and gear at various speeds.

From the foregoing it will be understood that in Fig. 1, for a given current through the motor, *B* shows the total torque which must be carried by the armature coils and teeth and *D* shows the total torque which must be transmitted through the armature shaft and pinion.

Bearing in mind these relations between the torque necessary to spin the wheels and the torque to retard the rotating parts, let us pass to a consideration of the transient values which occur when the motors are shorted on a loop circuit and allowed to build up as generators on a car running at a given initial speed.

The instant the motor circuit is closed the current starts to build up at a rate which is a function of the speed, the field strength and the impedance of the circuit. When the current has reached a value which gives a tractive effort equal to the slipping point of the wheels, say 25 per cent, the wheels start to spin on the rails at a speed less than the corresponding car speed and the coefficient of adhesion drops to say 15 per cent. From this point on the only force which can act to retard the mass of the car is equal to 15 per cent of the weight on the wheels plus the windage, but the force which can act to retard the rotating parts is limited only by the current through the motors. The current through the motors continues to rise after the slipping point is reached and the armature continues to slow down at an increasing rate until the maximum current point is reached.

After passing the maximum point the current decreases until the tractive effort falls to a value which is just sufficient to balance the coefficient of adhesion,

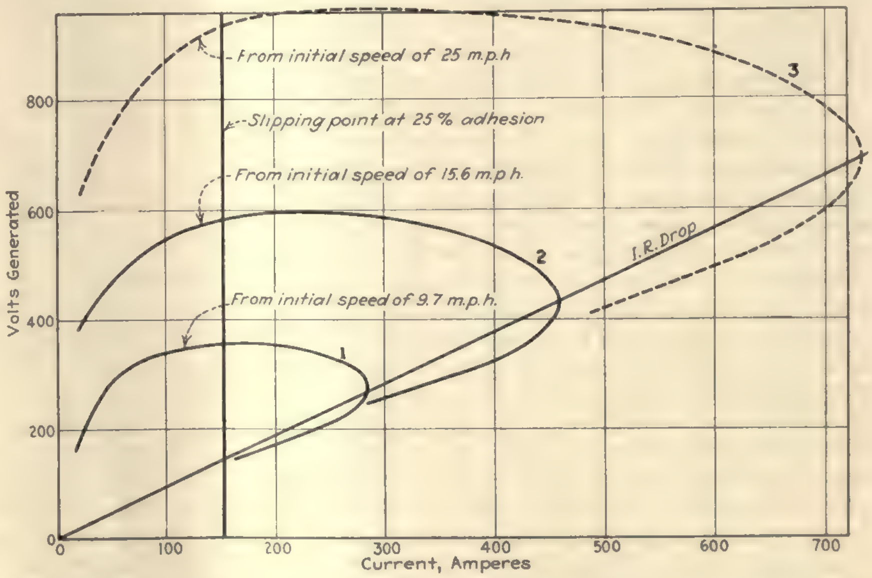


Fig. 3—Characteristic motor performance when bucking on a loop circuit

Curves 1 and 2 were determined from oscillograms taken on the equipment with characteristics given in Fig. 1. Curve 3 was calculated from Curves 1 and 2.

at which point the wheels may again grip and the cycle be repeated starting from a lower speed.

The rate at which the armature is retarded at any instant depends on the current, and the actual speed reduction depends on the duration of time for that current value, therefore it is evident that in order to figure the transient values we must determine the rate at which the current builds up.

From one of the oscillograms taken on type 532-B motors under bucking conditions, as previously mentioned, we are able to determine the current-time values on a test starting with an initial car speed of 9.7 m.p.h.

With this data we have been able to calculate the results shown in Fig. 2. The ampere-time curve (1) on this sheet is plotted directly from the oscillograph readings. The car speed curve (2) and the armature revolutions per minute (3) have been calculated from the ampere-time curve in the same manner as that employed in laying out an acceleration curve, starting with the known initial car speed.

For example, different current values were assumed and the time interval between each of these current increments was noted from the oscillogram, and the corresponding tractive effort from the motor characteristic curve. From the above data the reduction in car speed between current increments was figured up to the point where the tractive effort reached the slipping point of the wheels at 25 per cent adhesion.

After passing the slipping point of the wheels, Fig. 1 was used to determine the rate of retardation of the armature and other rotating parts for each current increment and the decreased speed of the armature was calculated for each point.

From the point where the wheels start to slip the speed of the car and the speed of the armature bear no relation whatever to each other, as the car continues to be retarded only under the influence of the spinning adhesion and windage, whereas the armature is being retarded at a constantly increasing rate as the current continues to rise. After the armature speed curve (3) had been figured out, the curve for generated voltage (4) was deduced from the known saturation curve of the motor.

Curve 5 has been added to this sheet to show the number of times that the torque exerted for the different current values exceeds the normal full load motor torque. It will be noted that the maximum value in this particular case is 5.2 times full load torque.

On curve 1, Fig 3, the generated voltage has been plotted against the current for the same values as shown on Fig. 2. Curve 2 on this same sheet was calculated from another oscillograph curve in the same manner as curve 1. This second curve started, however, from an initial speed of 15.6 m.p.h. Curve 3 was constructed from an initial speed of 25 m.p.h. on the basis of the data obtained in curves 1 and 2.

The total resistance of the loop circuit, including the motor and wiring, was 0.9375 ohms and the curve marked *IR* is this value multiplied by the current. The vertical distance from the *IR* curve to any of the three curves represents the inductive volts. The maximum current value for each curve naturally occurs at the point where the curve crosses the *IR* curve, for at that instant there is no change in the current and consequently no induced voltage, so that all of the generated voltage is taken up in the *IR* drop. An inspection of curves 1, 2 and 3 shows that they are of the same form, but of a magnitude increasing in practically direct proportion to the initial car speed at which "bucking" is started.

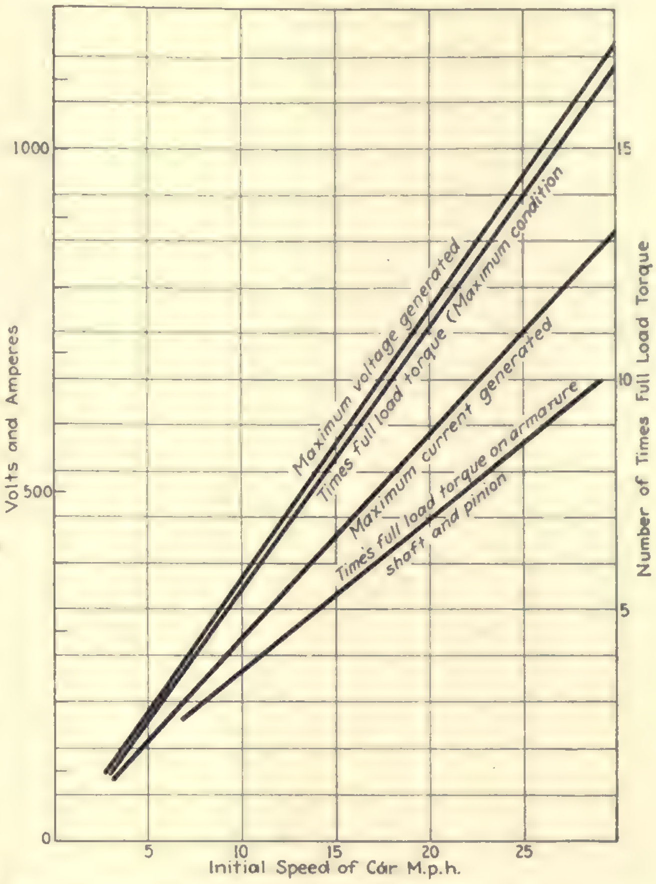


Fig. 4—Maximum values of voltage, current and torque generated while bucking the motor with characteristics shown in other figures from various initial car speeds

From the above it is apparent that it is only necessary to determine the form of the current-time curve for a given equipment for one given speed and the performance for any other speed can be readily deduced. It will be noted that in this particular case the maximum voltage is generated at a short interval after the wheels start to slip and that the maximum current occurs a little later when the generated voltage has fallen to approximately 72 per cent of its maximum value.

In Fig. 4 are shown in simple straight line functions the final results obtained from curves previously mentioned. From this curve it is possible to see at a glance the maximum voltage, current and torque which can be generated when bucking motors on this particular equipment at various initial speeds. For instance, if the motors are bucked at a speed of 25 m.p.h. the maximum voltage generated will be approximately 950 volts, the maximum current 730 amp. and the maximum torque fourteen times that of full load.

The values on this curve are the maximum with the conditions as assumed and, of course, under certain operating conditions the values may not be as great. On the other hand, it must be remembered that with a greater weight per axle and a higher coefficient of adhesion the conditions will be considerably worse.

It might be argued that these values will never be reached in practice due to the fact that the motors would flash over. No doubt flashovers would limit the maximums to a certain extent, but we do not have any definite data as to just what these limits would be. It should be remembered that the fact that the maximum voltage and maximum current are not coincident will have some influence on this question. Tests have been made as to the flashing points on different motors with various speeds and voltages, with moderate currents, but the data are rather meager as to the "flashover" point with tremendously oversaturated fields.

We do know that on tests made on type 532-B motors in Baltimore in 1920 currents in the neighborhood of 475 amp. per motor were obtained without flashovers, and the writer has seen the potential go up to approximately 1,000 volts on other motors when used for braking, also without apparent flashover.

In 1914 a test was made with a three-car multiple-unit train, bucking the motors at a speed of 40 m.p.h. The wheels on the front car revolved backward through the stop, while those on the rear cars alternately rolled and slid. When the train came to rest every motor was smoking and there were numerous flat spots on the wheels. No records were made of the current values in this test, but no doubt they were terrific and the stresses correspondingly large.

This discussion has considered particularly the effect of bucking motors, but it must be remembered that these high current peaks may be produced in other ways. It is quite probable that cracks in shafts or pinions may be started in some cases by these tremendous momentary stresses and that later on they develop into inexplicable failures under apparently normal service conditions.

Joliet Worm-Drive Trucks Impress Railway Men During Test

Experimental trucks mounted under temporary body for demonstration run. Fixed bolster construction proves successful

JOLIET'S new worm-drive street car trucks, developed by J. R. Blackhall, vice-president of the Chicago & Joliet Electric Railway, in collaboration with the Timken-Detroit Axle Company, Westinghouse Electric & Manufacturing Company and other equipment makers, were given an official test run under varying conditions of track between Joliet and Lockport, Ill., on May 13. In the estimation of more than 50 street railway officials, electrical engineers and manufacturers' representatives who attended, the demonstration was comprehensive and thoroughly satisfactory.

Aside from a slight ring or hum to the wheels when operating at high speed, a condition which Mr. Blackhall contends exists entirely in the wheels and not in the gears, the new trucks fully measured up to expectations. The Timken company is now co-operating with Mr. Blackhall to still further improve the operation. A detailed description of the truck, which represents the most important major change in truck design in many years, appeared in the April 2 issue of ELECTRIC RAILWAY JOURNAL.

To provide some degree of contrast for comparison during the demonstration runs, two regular city-type street cars were used on the 12-mile test trip, one mounted on the new worm-gear trucks, the other on trucks of the conventional type. On the outbound trip, the entire group of 60 visitors were loaded into the car equipped with the new trucks. On the return, half of the passengers were asked to ride the old-style car so that they might notice the difference in riding qualities.

The automotive trucks, developing a maximum speed during the trip of 34 m.p.h., negotiated sharp curves, 5-deg. grades, and special trackwork with the utmost ease and smoothness. As the car was put through its paces the visitors were greatly impressed with the comparatively quiet operation, simple method of control, and unusually comfortable riding qualities of the trucks.

At one stage of the trip the passengers were requested to leave both cars so that they might closely observe the behavior of the new-type trucks in crossing a double-track steam railroad line. Although both cars took the crossover at approximately the same rate of speed, it was noticed that there was considerable jolting and rattle as the ordinary standard trucks passed over the intersection. On the other hand, the new trucks sped over the crossing with an almost inaudible click.

In rounding curves at high speed, there was a significant absence in the test car of the customary shrieking of wheels and swaying of the body. This Mr. Blackhall attributed to the differential drive in the axles, which, as in the case of automotive vehicles, permits the outer wheel to revolve faster than the inner one. The action of the trucks on curves and special trackwork, even at full speed, was steady, smooth and quiet.

Instead of a floating bolster such as employed on the worm-drive car recently tested at Springfield, Mass., the Joliet trucks have a stationary bolster. Riding action depends upon the long half elliptic side springs mounted in Masury rubber shock absorbers on the side frame, instead of shackles. Several of those present were impressed by the success of this fixed bolster construction and considered that it actually improved the riding qualities of the car.

Some idea of the relative performance of the old and new type of trucks may be gathered from the following table, which was compiled by Mr. Blackhall and handed to his guests at the conclusion of the test:

	Car With Automotive Trucks	Car With Ordinary Trucks
Total miles	12.0	12.0
Total kilowatt-hours	23.0	23.0
Total passengers	58.0	None
Estimated passenger weight	5.07 tons	
Estimated car weight	16.00 tons	18 tons
Total estimated weight	21.07 tons	18 tons
Kilowatt-hours per car-mile	1.92	1.92
Watts per ton-mile	90.8	106.5
Saving in watts per ton-mile, per cent	14.8	
Kilowatt-hours outbound	15.2	11.5
Kilowatt-hours inbound	7.8	11.5
Kilowatt-hours per car-mile outbound	2.53	1.92
Kilowatt-hours per car-mile inbound	1.30	1.92

Worm-drive trucks under regular city car body

In judging the results of the demonstration, visitors were asked to bear in mind the fact that the trucks are intended for use with a light-weight city-type car, built of duraluminum (17 SD aluminum alloy) and representing an entirely new departure in construction and design. While in the body used on the demonstration run no particular thought was given to such matters, the new car will be provided with rubber-tile flooring and other devices to deaden noise. All materials for the car have been ordered, and delivery is expected from the manufacturer, the Cummings Car & Coach Company, of Paris, Ill., some time in August. The car will have an over-all length of 41 ft. 3 in. and will accommodate 52 seated passengers. Its weight is estimated to be only about 22,000 lb. complete, as compared with the 38,500-lb. cars now operated on the Joliet line.

The Westinghouse automotive-type diaphragm braking system used with the new trucks was examined with particular interest by the inspection party. Much favorable comment was heard on the simplified design and the noticeable absence of rattling, due to complicated brake rigging. A small hand brake for use in case of air failure is the only conventional rigging in the entire truck frame. With more than 80 sq.in. of braking area per wheel, as compared with a possible 40 in. on ordinary trucks, the equipment demonstrated extraordinary capacity for quick, smooth and quiet stops. In fact, it was felt that the brake rigging as now designed provides greater retarding power than is necessary.

By virtue of the increased speed, quicker acceleration and retardation of this type of truck, Mr. Blackhall hopes to be able to decrease the number of cars needed to handle present loads on his system by 20 per cent. By mounting the lighter-weight high-speed Westinghouse motors on spring-suspended members of the truck frame rather than directly on the axles, it is his belief that the wear and tear on the rails, as well as on the cars, will be considerably reduced. In addition he feels that track construction costs will be lowered; because lighter-weight rails may be used. It is estimated by the manufacturers that between 750,000 and 1,000,000 car-miles will be obtained from the worm-gear drive.

The new trucks were placed in regular operation in city service immediately following the test. They are an outgrowth of more than two years of study to develop a type of equipment that will popularize street car riding. Through the development of this improved truck, Mr. Blackhall evidences his sincerity in consistently advocating for many years the application of scientific research to street car construction and design.

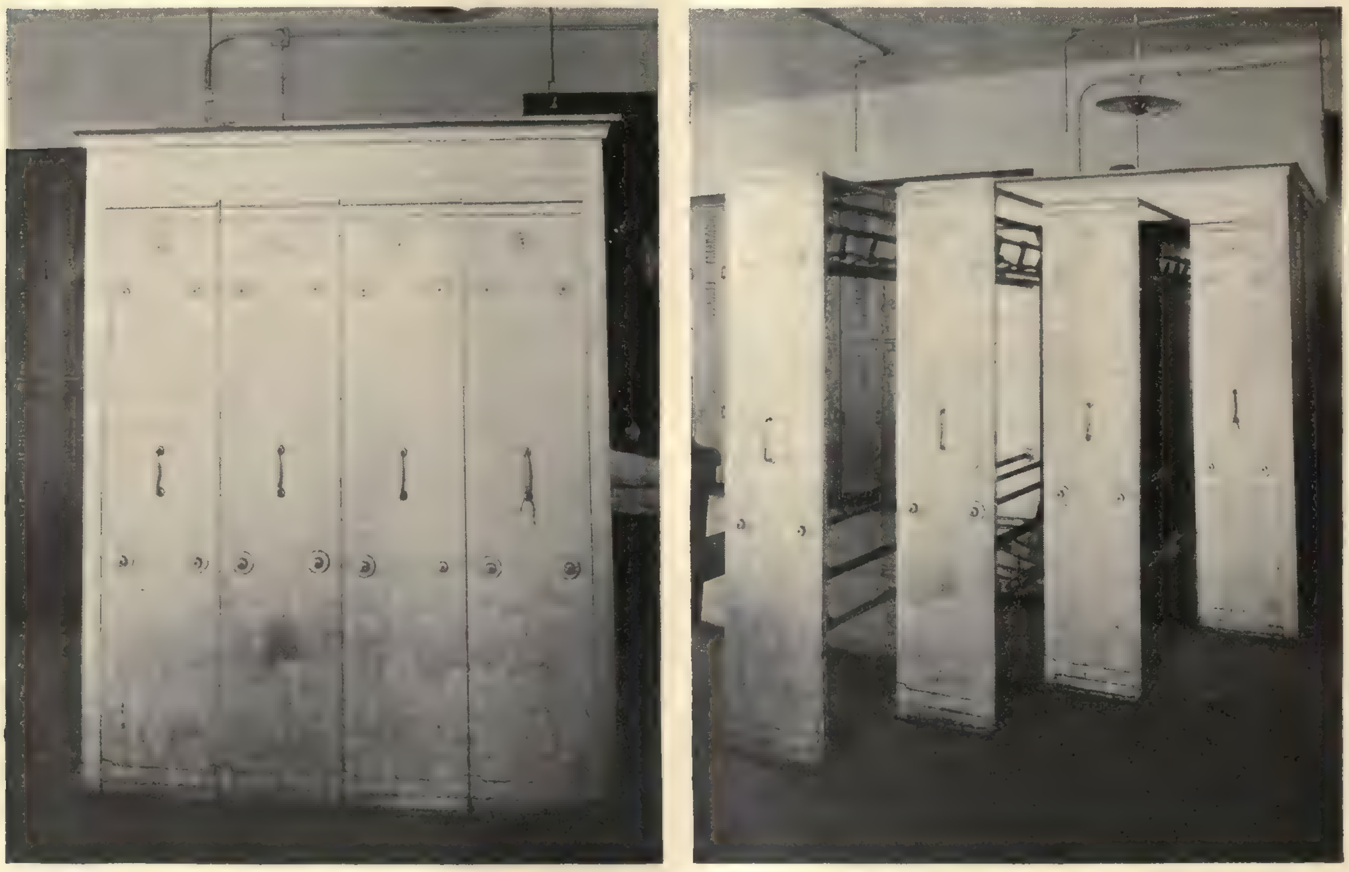
The following men were present during the demonstration run:

G. W. Welsh, T. H. Shaughnessy, Michael O'Brien, F. J. O'Brien, R. M. Stewart, R. Doyle, H. A. Barbero, G. F. Dougall, J. B. Barton, H. H. Lytle, Clarence Brown, George A. Bendel, B. E. Keifer, Wm. C. Naegel, H. C. Maddux, Harold E. Larsen, W. G. Norris, George E. Fox, N. R. Brownyer, W. L. Love, Charles F. Dahlquist, Lewis M. Williams, C. W. Gifford, F. S. Thomas, H. H. Adams, C. W. Young, S. M. Nahikian, D. C. Evans, C. L. Van Auken, R. S. Bull, R. H. Parker, Fred P. Biggs, Fred A. Morgan, H. H. Chapman, John S. Y. Fralich, L. C. Datz, C. W. Young, Wm. Bonn, George Watts, A. P. Jenks, Bert Collett, W. C. Wheeler, D. S. Owens, R. Sonnalind, J. D. Roberts, M. Murphy, J. R. Blackhall, George A. LeRiche, W. H. Heun, A. W. Baumgarten, C. E. Rogers, S. L. Vaughn, Mr. Nielson.

More than 50 railway officials, engineers and manufacturers attended the test

Laundry Drier for Wet Uniforms

EIGHT of the division headquarters of the Brooklyn City Railroad are equipped with clothes driers so that wet uniforms of transportation men can be dried quickly, if necessary. This equipment was installed several years ago and has proved very useful, particularly for car crews employed on open cars in summer, of which Brooklyn still operates a considerable number. With sudden rainstorms the crews are apt often to get thoroughly drenched. With the growing use on this property of closed equipment throughout the year and the consequent abandonment of open cars there is not so much call for this drying equipment. However, it is also used by inspectors and other transportation employees who are exposed to the weather and so is still kept in the carhouse. Similar equipment will be of interest to other companies where operating conditions make the drying of uniforms at carhouses a matter of considerable convenience.



With this apparatus, used on the Brooklyn City Railroad, wet uniforms can be dried quickly. The view at the left shows the drier closed, that at the right shows the drier with three of the four sections open

The drier is one which was really built for use in laundries and consists of four movable sections with frames for supporting clothes. The ends of these sections are mounted on rollers so that they can be moved in and out easily. Each section is equipped with several rows of horizontal rods, the upper rods carrying clothes hangers, on which the uniforms can be placed, and the lower rod wire netting for supporting shoes and underclothing. When closed, the drier occupies a floor space of 6 ft. x 14 ft.

The rear of the drier is equipped with a fan and ¼-hp. motor. This fan draws in air through louvers near the bottom of the drier and blows across an electric heater, after which it passes around the wet clothing. The air escapes through a ventilator at the top of the drier. A considerable number of uniforms can be dried quickly in this device in a very short time.

Consolidation of Dispatching Towers Boon to North Shore Service

WITH the recent completion of a new dispatcher's office and tower at the North Chicago Junction station, dispatching points on the Chicago, North Shore & Milwaukee Railroad systems formerly located at Harrison Street, Milwaukee, and at Highwood, Ill., have been centralized in the new unified dispatch tower. The building, which houses the dispatchers who control all main line train movements between Milwaukee and Howard Street, Chicago, is built at the south end of the station platform at North Chicago Junction. This is a strategic position, from a dispatching standpoint, as the Waukegan line, the Old Shore line, the Skokie Valley route, as well as the main line to Milwaukee, all converge at this point. The relocation tends to facilitate train operation, inasmuch as the men who route the trains are posted at the most important junction of the system.

J. W. Simmons, superintendent of transportation, states that through the use of the tower greater coordination is possible between the new train schedule recently put into effect and the facilities afforded through unified control.

The Readers' Forum

Intent of Chicago Traffic Code Explained

CHICAGO SURFACE LINES

CHICAGO, May 18, 1927.

To the Editor:

In the ELECTRIC RAILWAY JOURNAL of May 14 there is an editorial that misstates the intent of the new traffic code that has been adopted in Chicago.

The code as adopted at present is essentially the same as is printed in the report of the Metropolitan Street Traffic Survey, prepared under the direction of the street traffic committee of the Association of Commerce by Miller McClintock, except for three items which were left for further consideration by the Council after the Council could be reorganized following the election. These items covering parking, turning in the middle of the block and the creation of loading zones have not yet been fully decided. Otherwise the code was adopted substantially as presented in the report from the street traffic committee.

The code now reads as follows:

> SECTION 11. *Pedestrian's Limited Right of Use of Roadway.*—At no place shall a pedestrian cross any roadway other than by the most direct route to the opposite curbing, and when crossing at any place other than a crosswalk shall yield the right of way to all vehicles upon the roadway.
>
> SECTION 12. *Pedestrians to Obey Signals.*—At intersections where traffic is directed by a police officer or by a signal commonly known as a stop and go signal, it shall be unlawful for any pedestrian to cross the roadway other than with released traffic, if such crossing interferes with the movement of traffic.

From these sections you will note that there is no intent to eliminate crossing at points other than at intersections, nor is complete regulation of pedestrians by signals intended.

Forcing pedestrians to move only with signals has not been considered by the committee to be desirable, necessary or in the best interests of the traffic movements on the street. Such regulation may be applicable some time, some where, but there is much valid argument against such regulation in business areas of large cities. In fact, due consideration resulted in the opinion that there is an overwhelming proportion of the arguments in favor of the interpretation as written in the Chicago code as above quoted.

I hope you will find some adequate way of correcting the impression that Chicago did adopt what is usually termed "pedestrian control." E. J. MCILRAITH,
Staff Engineer.

Master Mechanics Are Working for Progress

CHICAGO, SOUTH BEND & NORTHERN INDIANA RAILWAY COMPANY

SOUTH BEND, IND., May 23, 1927.

To the Editor:

On behalf of the Central Electric Railway Association Master Mechanics, I wish to thank you for the fine articles which appeared in the May 21 issue of ELECTRIC RAILWAY JOURNAL covering the meeting in Pittsburgh on May 11 and 12.

It is through the fine co-operation that you are giving the industry through the pages of ELECTRIC RAILWAY JOURNAL that the industry is finding itself and is starting to forge ahead. I am sure that from these articles every electric railway operating official will fully realize that the C.E.R.A. Master Mechanics are not holding meetings of play, but are actually trying to accomplish something for the industry as a whole.

GEORGE R. GREEN,
President C.E.R.M.M.A.

Hazards of Street Work Increasing

DENVER TRAMWAY CORPORATION

DENVER, COL., March 26, 1927.

To the Editor:

Your editorial on page 564 of the Oct. 2, 1926, issue of ELECTRIC RAILWAY JOURNAL on the increasing hazard that attaches to street work impressed me as timely, and ever since I have been on the watch for something more on the subject.

I am aware that the subject has been touched on before this, also handled not so long ago in the A.E.R.A. questionnaire, but to my mind it has only been scratched.

It was again brought to my mind very forcibly through the death of one of our track foremen on the night of March 16 at 9 o'clock, while engaged with a helper in cleaning out and salting switches, curves, etc., just after a snowstorm. The street intersection was well lighted, also a full moon helped to indicate objects ahead.

In view of the seriousness of the subject and the increasing number of injuries and fatalities I for one would be very much pleased to see this matter kept alive through the columns of the JOURNAL in some way until we can at least learn what method or practice has been found to give the best protection to the men who have to make repairs and do other routine work in the streets in connection with ordinary track maintenance, especially between sundown and daylight.

In checking back over the records I find that between February, 1923, and March 16, 1927, inclusive, our experience has been seventeen men seriously injured, two of whom died, as a result of being struck by automobiles while engaged in trackwork in the street.

W. G. MATTHEWS,
Superintendent Way and Structures.

Improved Employment Conditions in St. Louis

DATA comparing the wages paid by the United Railways, St. Louis, Mo., in different years in their relationship with changes in personnel or annual turnover have been prepared by Richard J. Lockwood, assistant manager. In 1913 the carmen averaged 25 cents an hour and the turnover was 34 per cent. Now the average wage is 64 cents an hour and the annual turnover only 13 per cent. More stable employment conditions also prevail in the mechanical departments, where, with 1,000 men employed, not one was hired or discharged from April to July, 1926.

This more stable condition in the company's personnel is believed to have had a marked effect on the number of accidents. During the year 1926 11 per cent of all traffic accidents on the car system involved men who had been employed only one year or less, although these men comprised only 9 per cent of the total number of trainmen employed.

Maintenance Notes

Crane on Flat Car Solves Pole-Setting Problem

WHEN the Cleveland Electric Illuminating Company recently took over the light and power lines in Avon, Avon Lake and Bay Village, Ohio, formerly owned and operated by the local electric interurban railroad, it was confronted with the necessity of reconstructing the line to bring the service to a higher standard. The work presented a number of problems, not the least of which was rebuilding the main feeder for the territory so as to make it a 33,000-volt line along the right-of-way acquired from the Lake Shore Electric Railroad. This ran close to an 18,000-volt feeder in use by the interurban line, which made the job highly hazardous.

The program called for setting more than 9 miles of poles ranging in height from 45 to 64 ft. and stringing wires on them.

From the standpoint of weather, no more unfortunate time for this work could have been chosen. Rain was almost incessant, windstorms were frequent and much of the ground along the right-of-way was a quagmire. Service requirements made it necessary that the work go forward with all possible speed despite obstacles.

For a number of years the line department had relied on its hole-digging and pole-setting machines, which were installed on motor trucks. The engineers soon found, however, that the trucks were unsuitable for more than half of this job as there were no roads and the fields were impassable for caterpillar tractors. Setting by manual labor, of course, was a slow process and the urgent need for service made speed necessary.

The company had two Universal cranes which were mounted on White trucks. These were used for general construction, such as digging conduit trenches, backfilling, handling surplus materials, transporting cable reels, loading, unloading and setting poles, dipping poles into creosote pits, erecting substation steel, erecting transmission towers and moving transformers. A flat car was obtained from the New York Central Railroad and one of the cranes was readily removed from its motor truck and mounted above the truck at one end of a flat car. This equipment, hauled by an electric locomotive, made a handy means for distributing the poles along the interurban right-of-way and for placing them in the holes when dug.

Setting a pole in position after the hole has been dug

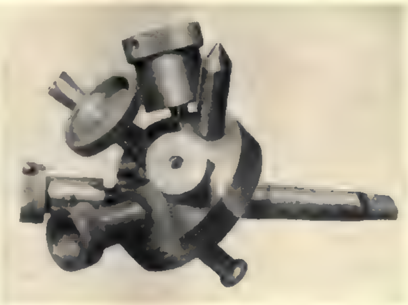
For the hole-digging operation the line department used a new type of portable hole borer built by the Buda Company. This is a special type of unit built for use with the Universal crane with a bale which enables the crane to pick it up and swing it into place. An artillery leg style tripod provided quick adjustment in position over the hole as soon as the crane set it down.

When the equipment came to the site for a pole the crane lifted the borer off the car and set it over the

Placing the hole borer in position for digging a hole spot where the hole was to be dug. A gasoline engine on the borer was cranked and in an instant the dirt was flying. In this way 185 poles were set in less than half the time that it would have taken by hand. A good day's run averaged thirteen set-ups, which included digging the post holes, moving time and setting 55-ft. poles in the holes. Linemen followed up the pole-setting crews closely, stringing, sagging and tying ¾ mile of wire per day.

Turret Tool Holder for Tailstock of Small Lathe

In ELECTRIC railway repair work it is sometimes necessary to make small parts, such as special screws, pins, bushings or studs, which require several tools for the complete finishing. For such work a turret tool holder which can be placed in the tailstock of an ordinary lathe has been devised and is in use in the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. The holder shown in the accompanying illustration is arranged for attaching six different tools—three holders for dies or hollow mills, a drill, a drill chuck and a center.



Turret head used to hold six tools in the tailstock of an ordinary lathe

Provision is made for attaching such tools to the conical surface of the turret, which is at an angle of 45 deg. with the circular face which fits against the bottom retaining portion of the turret head. This bottom circular retaining portion is mounted at an angle of 45 deg. to the axis of a tapered shank of size and shape to fit into the lathe tailstock. It will be seen that when a tool is rotated to the bottom position of the turret head it will line up accurately with the supporting shank and so in effect be an extension of the shank.

The knurled knob in the center of the device is for rotating the tools to their proper positions. Headless set screws on the inside conical surface clamp the various tools securely in position. At the back of the stationary face of the turret head is a coned projection which contains a pawl, which is pressed into holes in the rotating part of the turret head by a spring. This pawl can be released by pulling a small knurled knob seen on the back, and then the turret head can be rotated until the desired tool is in position and locked securely.

Win One of the

Maintenance Prizes

DID the seven short items published in last week's Maintenance Data Sheet section of ELECTRIC RAILWAY JOURNAL suggest any improved methods or devices that you are using, which should be entered in the Maintenance Competition? Look them over carefully. They illustrate the class of material that will win the prizes.

In addition to the capital prizes, $25 will be paid each month to the winner of the monthly contest.

Three Capital Prizes

First	**$200**
Second	**$100**
Third	**$ 50**

Any one who wins one of the prizes will be recognized as a leader in improved maintenance. Here is a chance to win the recognition you deserve.

Equipment men are off to a flying start, as is evidenced by the large number of items received from equipment departments. Line and track maintenance men are urged to send in descriptions of some of the useful things they are doing.

Condensed Rules for the Contest

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 each will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

New Equipment Available

Large Welding Rods

"DIPPED" welding rods of a new type are now obtainable from the Lincoln Electric Company, Cleveland, Ohio. This dipped steel rod is the result of several years study in the company's research laboratories and will be known as "Stable-Arc" welding rod. With this new rod it is possible to go to considerably larger diameters than has been customary in welding rods for metal electrode welding and is being carried in all sizes up to ½ in.

It is claimed that this rod permits of much higher currents than has been used heretofore, with the resulting greater speed. As labor is by far the greatest factor in welding costs, increased speed means a substantial decrease in welding cost. Not only does the greater heat give greater speed and less cost but also better penetration and a much smoother finished bead. In addition the greater heat obtainable by the higher currents results in an annealing action which increases the ductility of the weld and gives a greater elongation. Current densities of 15,000 amp. and more per square inch can be used.

The claimed decrease in the "splutter" of the arc gives less spattered metal and therefore more actual metal is deposited per pound of rod. The higher currents, it is claimed, give a remarkably clean finished weld and on heavy welds of more than one layer very little brushing is necessary between beads.

"Stable-Arc" welding rod is obtainable in standard 50-lb. bundles wrapped in burlap and in lengths of 14 in. It can also be secured in longer lengths if desired.

Electric Railway Wrecker

FOR use on the trolley system of Cologne, Germany, a crane mounted on a car has recently been constructed by the Linke-Hofmann Werke Gesellschaft of that city. It is used for removing motor vehicles which break down on the track and so interfere with traffic and also for handling electric railway supplies, such as rails, ballast, etc.

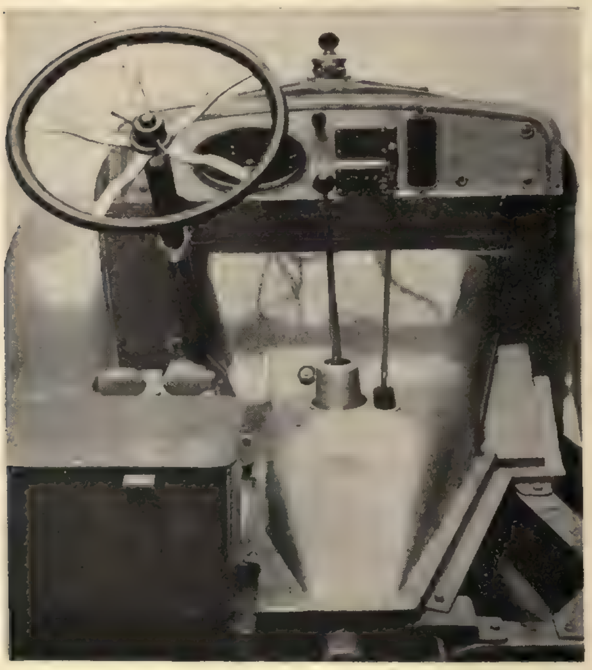
The crane is mounted on a double-truck car equipped for motor drive from the trolley circuit arranged for control from either end. The crane, which is mounted on a turntable in the center of the car, has capacity to lift loads up to 1¾ tons. The electrical equipment was manufactured by the Allgemeine Electricitäts Gesellschaft and includes two 60-hp., 600-volt motors for driving the car, an 8-hp. shunt-wound motor for the lifting load and a 4-hp. series motor for rotating the crane about the turntable.

Improved Bus Chassis

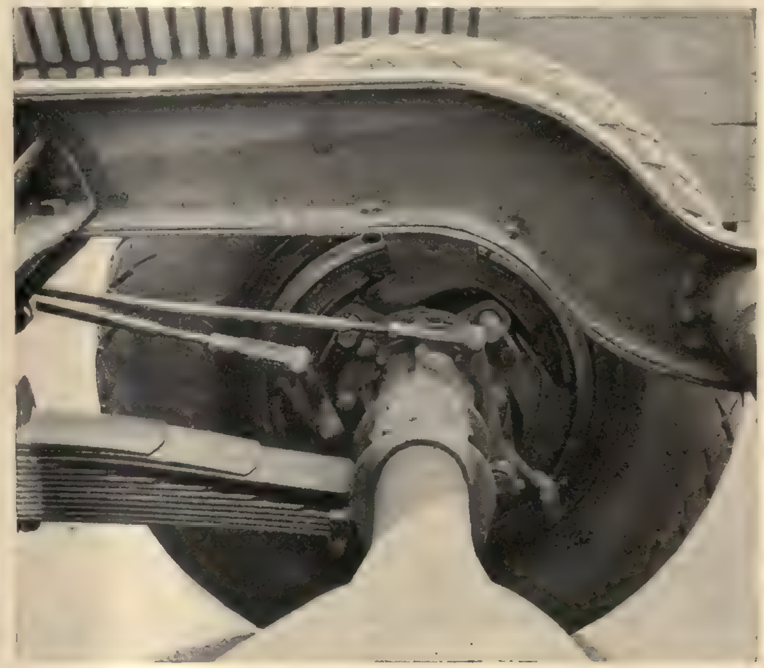
SEVERAL interesting improvements have been incorporated in the latest type of chassis marketed by the Six-Wheel Company, Philadelphia, Pa. These include a permanent dash with the instrument panel and all instruments grouped under glass. The hood is fitted at the factory to a ledge on the permanent dash and all chassis wiring is completed to junction boxes and to the instrument panel. A cast-aluminum transmission cover and aluminum floor covers are also installed. The metal battery box forms a permanent base for the driver's seat.

Brakes are of the locomotive brake shoe type, four shoes for each wheel being used. All hinge pins and wearing parts of the brake assembly are lubricated. Either Westinghouse air brakes or the B-K vacuum booster brake system is furnished for service use and an entirely separate B-K booster is employed for the hand brake. Each system acts independently of the other and provides 530 sq.in. of brake area.

The exhaust is carried to the extreme left rear of the chassis and the heating system used in the body is connected to the exhaust line of the power plant. The 70-gal. gas tank is attached to the frame by spring trunnions. The crankcases are of duralumin. Counterbalanced crankshafts, vibration dampeners and ventilated clutches help to increase the efficiency.



A permanent dash with instrument panel is provided



Brakes are of the locomotive brakeshoe type, four shoes for each wheel

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—3

RULES COVERING

The Condition and Repair of Freight Cars for Interchange Service

Central Electric Railway Master Mechanics Association

Adopted May 11, 1927 **Effective Jan. 1, 1928**

These rules are formulated as a guide to the fair and proper adjustment of all questions arising between car owner and handling company with the intent of:

1. Making car owners responsible for and, therefore, chargeable with, the repairs to their cars necesitated by ordinary wear and tear in fair service and by the safety requirements of the United States safety appliance standards as applied to electric railways, and by the standards of the Central Electric Railway Association.

2. Placing responsibility and providing a means of settlement for damage to any car occurring through unfair usage or improper protection by the handling company.

3. Inspection of freight cars for interchange and a uniform system on which acceptance or rejection of cars offered in interchange are based.

Care of Foreign Freight Cars

Rule 1. Each railroad is responsible for the condition of all cars on its line, and must give to all equal care in handling and inspection.

Rule 2. Cars having defects for which delivering company is responsible must be properly carded when offered in interchange, as per Form 1. Empty cars offered in interchange must be accepted if in safe condition and serviceable for some commodity that can be loaded in the car, the receiving road to be the judge. Owners must receive their own cars, when offered home for repairs at any point on their line, subject to the provisions of these rules. Empty cars furnished on orders for specific lading must be in serviceable condition for such lading, the receiving road to be the judge. If not acceptable they must be carded with return card Form 2.

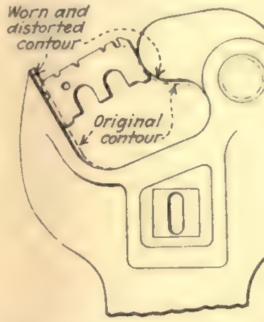


Fig. 1

Rule 3. Loaded cars offered in interchange must be accepted when in safe operating condition and when meeting the allowable clearances and permissible weight as determined by track, bridges and structures, with the following exceptions:

(*a*) Cars (whether loaded or empty) having defects in violation of the Safety Appliance Acts, will not be accepted in interchange.

(*b*) Cars loaded with explosives must be handled in accordance with regulations of the Interstate Commerce Commission Cars containing inflammable liquid which is leaking must be repaired or transferred without any unnecessary movement or at nearest available point.

(*c*) Cars improperly loaded when transfer or rearrangement of lading is necessary.

(*d*) Lading of open cars when dimensions of lading are in excess of clearances of roads over which the shipment is destined the receiving road to be the judge.

(*e*) When cars can not pass third rail or overhead clearances for electrical conductors.

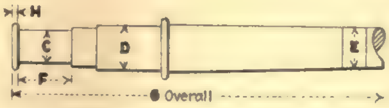
(*f*) Where roads require radial M.C.B. couplers, the rigid type will not be accepted in interchange.

(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

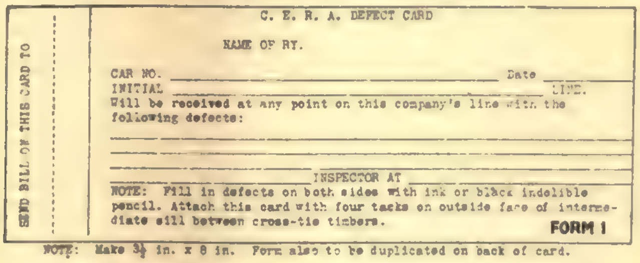
ROLLING STOCK—STANDARDS—7

C.E.R.A. Standard Axles and Limits of Wear



A Total Weight on Rail Lb.	B Nominal Capacity Lb.	Limits of Wear					Dimensions, New						
		C In.	D In.	E In.	F In.	H In.	C In.	D In.	E In.	F In.	G Ft.	G In.	H In.
251,000	200,000	6	7⅞	6¾	12½	¼	6½	8¼	6⅞	12	7	8¾	7/16
210,000	140,000	5½	7⅜	6 5/16	11½	¼	6	7¾	6 7/16	11	7	6¾	7/16
169,000	100,000	5	6¾	5¾	10½	¼	5½	7	5⅞	10	7	4½	⅜
136,000	80,000	4½	6¼	5¼	9½	¼	5	6½	5⅜	9	7	2½	⅜
103,000	60,000	3¾	5⅜	4 11/16	8½	¼	4¼	5¾	4¾	8	7	0¼	5/16
66,000	40,000	3¼	4⅞	4 3/16	7½	¼	3¾	5¼	4¼	7	6	11⅛	5/16

C.E.R.A. STANDARD DEFECT CARD



SEND BILL ON THIS CARD TO

C. E. R. A. DEFECT CARD

NAME OF RY.

CAR NO. __________ Date ______
INITIAL __________ LINE.
Will be received at any point on this company's line with the following defects:

__________ INSPECTOR AT __________

NOTE: Fill in defects on both sides with ink or black indelible pencil. Attach this card with four tacks on outside face of intermediate sill between cross-tie timbers.

FORM 1

NOTE: Make 3½ in. x 8 in. Form also to be duplicated on back of card.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—4

C.E.R.A. Inspection Rules (Continued)

Rule 4. The following defects must be repaired by receiving line while car is under load:

(*a*) Journals are to be lubricated or repacked when necessary; when bearings are required, the same kind are to be used when possible.

(*b*) All brake rods, levers, pins, brake beams and brake shoes.

(*c*) All air hose, cocks, valves and piping.

(*d*) Couplers, worn and distorted knuckles, chains and levers used for coupling and uncoupling.

(*e*) Temporary repairs to roof when condition of same endangers lading and when such repair does not exceed 25 per cent of the roof covering.

(*f*) Missing or defective side or end doors when same endangers lading from weather or theft.

Rule 5. A bad order foreign car delivered under load, if load is transferred or unloaded within switching district, may be returned to delivering line properly side-carded on both sides showing the defects for which the car was transferred or returned, in which case it must be accepted unless the receiving line has a direct physical connection with the car owner at that point, car to be carded as per Form 3.

Rule 6. In rejecting cars because of defects in violation of rule 3, all of the defects objected to must be designated with ink or black indelible pencil on return cards Form 2 and placed on both sides of car.

Rule 7. No car will be accepted in interchange unless properly equipped with United States safety appliance standards as applied to electric railways.

Rule 8. If a foreign car has defects, the receiving line shall require that a defect card be securely attached to the car, as per rule 2. Defect card shall not be required for any slight damage (new or old), that of itself does not require repairs before reloading of car. Defect cards shall not be required for raked or cornered sheathing, roof canvas, bent or cornered end sill if defects are old.

At points where joint inspection is not in effect, the matter will be left to the judgment of the receiving line. Where joint interchange inspectors are employed, the decision will be made by them.

Rule 9. All cards must be of the form specified in these rules and must plainly specify each item, indicating location of defects, as provided in these rules.

Rule 10. Any car having defects which render it unsafe to run, unsafe to trainmen or any lading suitable to car, must be repaired and be made safe to return to owner, billing repair card Form 4 to be used.

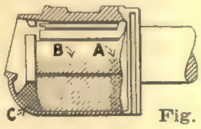


Fig. 2

Rule 11. The end of the car toward which the cylinder push rod travels shall be known as —*B*— end and the opposite end shall be known as —*A*— end. Facing —*B*— end of car, in their order on the right side of car, wheels, journal boxes and contained parts, shall be known as R1, R2, R3, R4, and similarly those on the left side of car shall be known as L1, L2, L3, L4. The same order of numbers shall be used for designating corresponding location of brake beams. In any case where right or left side is designated on defect, billing repair or joint evidence cards for other parts of cars, the same uniform order of location shall govern.

Rule 12. Cars must be maintained within the limits of standard height for couplers, measured from top of rail to center line of coupler head. As far as possible, cars should be adjusted when empty. When construction of car and trucks precludes the common methods of adjusting coupler heights, the application of metal shims between journal boxes and arch bars will be permissible. The use of liners between male and female portions of center plates is prohibited where the vertical bearing surfaces are reduced. The limits of height from top of rail to center of couplers shall not be less than 31½ in. and not more than 34½ in. under any condition of loading. When bill is rendered the height of car before and after altering must be shown in billing repair card Form 4.

Rule 13. Bills may be rendered against car owners for applying temporary transverse tie rods to cars with sides spread or bulged beyond the clearance limits of the handling line.

Rule 14. Couplers that exceed the distance of 5⅛ in. between point of knuckle and guard arm, measured perpendicularly to guard arm, must have the defective part or parts renewed to bring coupler within gage, in which case owner is responsible (see accompanying Fig. 1). When couplers of another make are applied to a car, the uncoupling arrangement shall be made operative at expense of the company making repairs. But in no case shall such changes be made that will destroy the original design providing the owner wishes to change again to meet their standard.

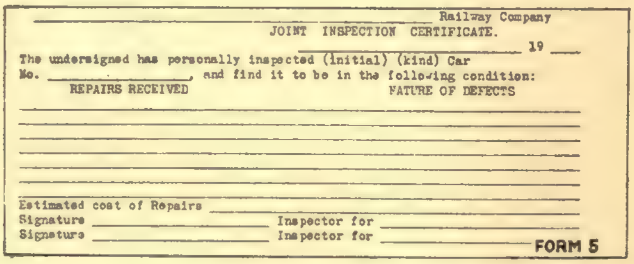
Locking device must come within 2 in.

(*Continued on next page*)

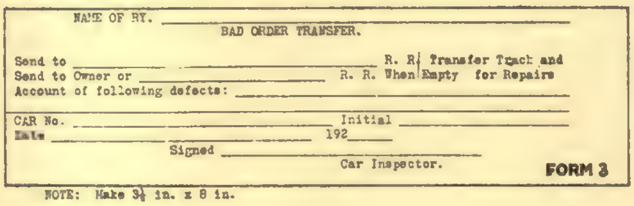
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—8

C.E.R.A. Inspection Cards

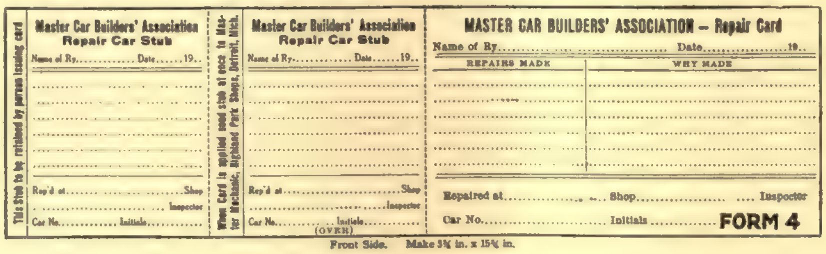


____________ Railway Company
JOINT INSPECTION CERTIFICATE.
________ 19 ___
The undersigned has personally inspected (initial) (kind) Car
No. ________, and find it to be in the following condition:
REPAIRS RECEIVED NATURE OF DEFECTS
Estimated cost of Repairs ________
Signature ________ Inspector for ________
Signature ________ Inspector for ________
FORM 5



NAME OF RY. ________
BAD ORDER TRANSFER.
Send to ________ R. R. Transfer Track and
Send to Owner or ________ R. R. When Empty for Repairs
Account of following defects: ________
CAR No. ________ Initial ________
Date ________ 192___
Signed ________
Car Inspector.
FORM 3

NOTE: Make 3½ in. x 8 in.



This Stub to be retained by person issuing card

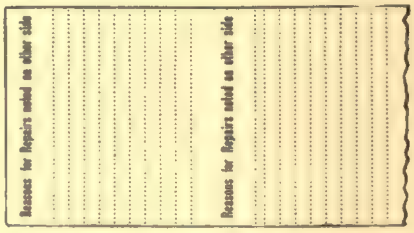
Master Car Builders' Association
Repair Car Stub
Name of Ry.............Date......19..
Rep'd at..............................Shop
..............................Inspector
Car No.............Initials.............

When Card is applied send stub at once to Master Mechanic, Highland Park Shops, Detroit, Mich.

Master Car Builders' Association
Repair Car Stub
Name of Ry.............Date......19..
Rep'd at..............................Shop
..............................Inspector
Car No.............Initials.............
(OVER)

MASTER CAR BUILDERS' ASSOCIATION — Repair Card
Name of Ry.............................Date.................19..
REPAIRS MADE WHY MADE
Repaired at.................Shop.................Inspector
Car No.............................Initials.............
FORM 4

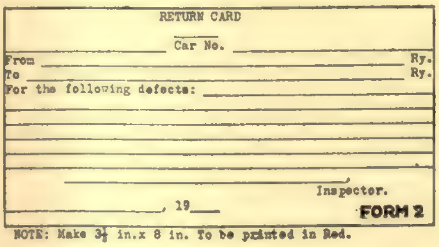
Front Side. Make 3¾ in. x 15¾ in.



Reasons for Repairs noted on other side

Reasons for Repairs noted on other side

Reverse Side of Form 4



RETURN CARD
________ Car No. ________
From ________ Ry.
To ________ Ry.
For the following defects: ________
________,
Inspector.
________, 19___
FORM 2

NOTE: Make 3½ in.x 8 in. To be printed in Red.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—5

C.E.R.A. Inspection Rules (Continued)

of knuckles. Anchor must not be loose and no anchor bolts missing. No cracks or defects on knuckles or drawbars or anchors are permitted.

Rule 15. *Wheels.* (*a*) Tread thickness measured 1 in. from edge of rim shall not be less than ¾ in. (*b*) No wheels must have over ¼ in. hollow tread. (*c*) Flanges not less than 11/16 in. thick. (*d*) Treads not to be over 3⅞ in. wide or under 3 in. at any point. (*e*) Must not have chipped flanges more than 3/16 in. wide x 1½ in. long. (*f*) Steel wheels must not have a flat spot over 2 in. long and cast iron wheels must not have a spot over 1 in. long. (*g*) Wheels must not be less than 54 in. inside measurement at gage line.

Rule 16—*Brakes.* (*a*) Not less than 6 in. or more than 8 in. piston travel under load. (*b*) Heads, beams, pins, rods, hangers, etc., must be in good repair. (*c*) Hand brake must be efficient and in good repair.

Rule 17—*Trucks.* (*a*) Side bearings to have at least 1/16 in. clearance under load. (*b*) Center bearings must be O. K. and well lubricated.

Rule 18—*Axles.* (*a*) The total weight of car and its lading must not exceed weight given in column "A." Column "B" is the nominal capacity stenciled on all cars. Axles must be removed from service when less than the prescribed limits in columns "C," "D," "E," in table of C.E.R.A. standard axles or when the condemning limits in columns "F" and "H" are reached.

(*b*) Standard A.E.R.E.A., axles must be used in replacing A.E.R.E.A. standard axles, subject to the condemning limits for such axles.

(*c*) When second hand axles are applied, the diameter of wheel seats and centers must not be less than the limiting dimensions shown, and the diameter of the journals must be at least ¼ in. greater than the limiting dimensions. The length of journals must not exceed ⅜ in. over standard length, the collar must not be less than 5/16 in. thick and the fillet at back end of journals on axles of 40,000 lb. capacity cars must not be less than ¼ in. radius, axles of 50,000 and 60,000 lb. capacity cars not less than 5/16 in. radius, nor less than ⅜ in. radius on axles of greater capacity.

Rule 19—No cast iron wheels will be accepted in interchange after Jan. 1, 1930.

Rule 20—All coupling hose must be 1⅜ in. x 18 in. with F.P.5 coupling and all flexible drawbar hose must be 1⅜ in. Other sizes will not be accepted in interchange after Jan. 1, 1930.

Rule 21—*Journal.* (See accompanying sketch.) Application of packing (*a*) Inner—In packing a journal box, twist somewhat tightly a rope of packing and place it in the extreme back part of the box, as shown at "A" in the accompanying Fig. 2. Make sure that it is well up against the journal so as properly to lubricate the fillet on the journal and keep out the dust.

(*b*) Main—Apply sufficient packing (preferably in one piece) to fill the space shown at "B." Take care to have this packing bear evenly along full length of the lower half of the journal. The packing should not be too tight but should be tight enough to overcome any tendency to settle away from the journal. The packing should extend to approximately the center line of the journal but not above at any point, and should be pressed down evenly at sides that no loose ends may work up under the journal bearings.

(*c*) Outer—Apply a third piece of firmly twisted packing as shown at "C," and pack tightly in order to prevent displacement of the main packing. There should be no loose ends hanging out of the box as they would tend to draw out the oil.

Rule 22. In no case shall car owner be charged for the second or subsequent applications of journal bearings if applied within 30 days from initial application at the same journal location on same road, except when renewed within such period account change of wheels or axle at same journal location, in case the application of wheels is chargeable to the owner.

Rule 23. Companies shall promptly furnish to each other, upon requisition, and forward, freight or express charges collect from point of shipment, material for repairs of their cars on foreign lines. If material is for repairs of car owner's defects, the foreign company may bill car owner for the entire freight charges, and in such case the car owner may reclaim freight charges for that portion of the movement over its own lines. If the material is for repairs of user's defects, the foreign line may reclaim only for that portion of the movement over its line.

A separate bill, with copy of freight, express or due bill attached, should be rendered for the freight or express charges showing reference to bill covering repairs.

Requisitions for such material shall specify that same is for repairs of car, giving car number and initial of such car, together with pattern number, sketch or other data to enable correct filling of requisition.

Rule 24. Repairs to foreign cars shall be promptly made, and the work shall conform in detail to the original construction, and with the quality of material originally used.

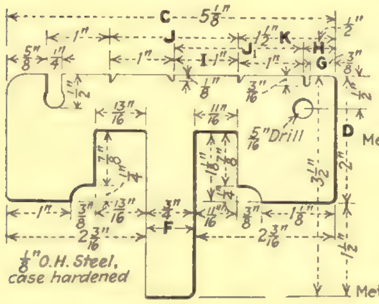
Rule 25. Any foreign road making partial or full repairs of defects on a car which is covered by a defect card, will have the defects repaired, crossed off the

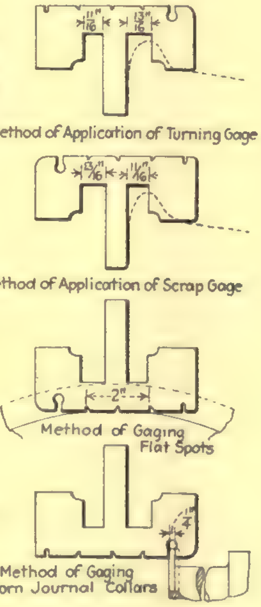
(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—9

C.E.R.A. WHEEL DEFECT, WORN COUPLER LIMIT, WORN JOURNAL COLLAR GAGE




Method of Application of Turning Gage

Method of Application of Scrap Gage

Method of Gaging Flat Spots

Method of Gaging Worn Journal Collars

Wheel Defect, Worn Coupler Limit, Worn Journal Collar Gage

*Overall length **C**-5⅛" is for gaging distance between point of knuckle and guard arm of coupler measuring perpendicular to guard arm*

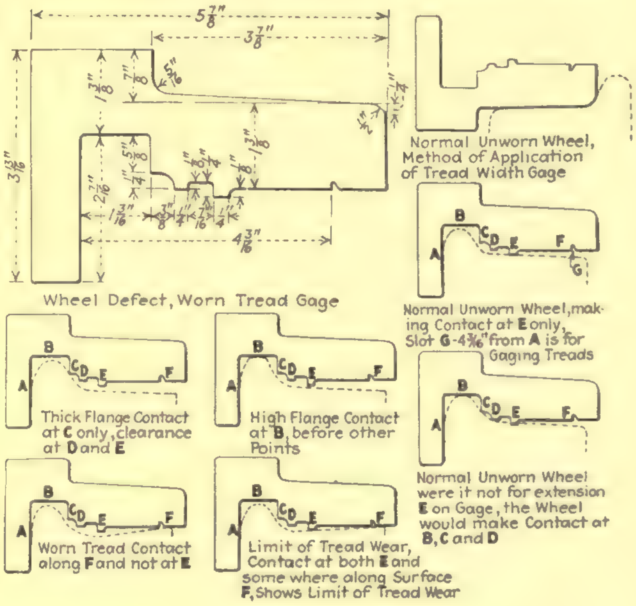
*Width **D**-2" is for gaging distance between point of knuckle and tongue of coupler*

*Width **F**-¾" is for gaging thickness of worn tread*

*Lengths **G** and **H**-(3/16" and 1½" respectively) are for gaging chipped flanges*

*Lengths **I-J-J₁-K** (1", 2" and ½" respectively) are for gaging the length of flat spots on the wheel tread*

C.E.R.A. WHEEL DEFECT WORN TREAD GAGE



Wheel Defect, Worn Tread Gage

Normal Unworn Wheel, Method of Application of Tread Width Gage

Normal Unworn Wheel, making Contact at **E** only, Slot **G**-4 3/16" from **A** is for Gaging Treads

Thick Flange Contact at **C** only, clearance at **D** and **E**

High Flange Contact at **B**, before other Points

Normal Unworn Wheel were it not for extension **E** on Gage, the Wheel would make Contact at **B**, **C** and **D**

Worn Tread Contact along **F** and not at **E**

Limit of Tread Wear, Contact at both **E** and some where along Surface **F**, Shows Limit of Tread Wear

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—6

C.E.R.A. Inspection Rules (Concluded)

original card with ink or indelible pencil and card replaced on car. A copy of the card so marked should accompany the bill.

Rule 26. When repairs are made to a foreign car, card Form 4 shall be used embodying the required information and reason why such repairs were required. Heads of mechanical departments will exchange memorandums in duplicate of labor and material charge plus 15 per cent applied to foreign cars during month for the purpose of having same approved so billing can be made by auditing department.

Rule 27. When repairs are made to a foreign car for which a bill will be rendered, immediately upon completion of such work a notice must be sent to the owner or Form 4.

Rule 28. Defect cards and joint evidence cards must be securely attached to both sides of car with at least four tacks.

Rule 29. No labor to be charged for the inspection of cars, testing or adjusting brakes, adjusting angle cocks, tightening unions, bolts, bolt nuts, lag screws or spreading cotters, sill steps, and hand bolts or straightening on car, brake shafts, uncoupling levers or carrier irons when not removed from car. No charge to be made for the material or labor of lubrication except when renewals are made due to defects.

Rule 30. On the first of each month, the operator will promptly forward to the owner a statement of the individual mileage operated by such owner's cars, for its information in connection with maintaining mileage records of cars and equipment of cars.

Rule 31. Delivering company is responsible for any of the following when happening on their line:

(*a*) Removing or cutting out parts of car so as to facilitate loading or unloading.

(*b*) Known theft of parts of car occurring on its lines.

(*c*) Damage to any car if caused by: (1) Derailment; (2) cornering; (3) sidewiping; (4) collision; (5) colliding with or shoving over bumping posts or other fixed obstructions; (6) overloading; (7) collapsing buildings or other structures on right of way; (8) unconcealed fire damage; (9) failure to close hoppers or drop doors before moving car; (10) improper coupling of cars; (11) improper coupling of cars at excessive speed; (12) unfair usage of equipment.

Rule 32. Damages to foreign car for which the delivering company is responsible should be repaired at once unless such damaged car is under load and can proceed to destination in conformity to rules as herein prescribed. The company responsible for the damage shall at once notify the owner and arrange how or by whom the repairs shall be made.

Rule 33. When a car having damage for which delivering line is responsible is found with other defects which are ordinarily the owner's responsibility and are not associated with delivering line defects, such fair usage defects may be repaired at car owner's expense. Reported on billing repair card Form 4.

Rule 34. When a foreign car is destroyed or badly damaged, the owner shall upon request, furnish depreciated reproduction value of car complete, and the company responsible shall have the option of repairing or settling under the depreciated reproduction value. Depreciations to be figured from the date that the car was built or if built or acquired prior to when the road came under the acts of the Interstate Commerce Commission, its value as there fixed should be used to figure from.

Rule 35. For the mutual advantage of railway companies interested, the settlement for a car owned or controlled by a railway company, when damaged or destroyed upon a private track, shall be assumed by the railway company delivering the car upon such tracks.

When a car owned or controlled by a railway company is damaged or destroyed on the tracks of a road which is not a member of the per diem rules agreement of the Central Electric Railway Association or not a subscriber to these rules, the road responsible for the per diem while in the possession of the non-subscriber shall be responsible to the owner for damages to or for the destruction of the car.

Rule 36. If the company on whose lines the car is destroyed elects to rebuild the car, the original plan of construction must be followed, and the original kind and quality of material used. No allowance shall be made for betterments not authorized by car owner.

Rule 37. When a foreign car requires general repairs such as wheels, truck frames, bolsters, broken axles, etc., for which the owner is responsible and its condition will not permit its return home, it shall be inspected by the handling line and an inspection certificate made, using Form 5 (except the joint inspection will not be necessary) covering all defects found on car, and estimated cost of repairs, total labor and total material separately.

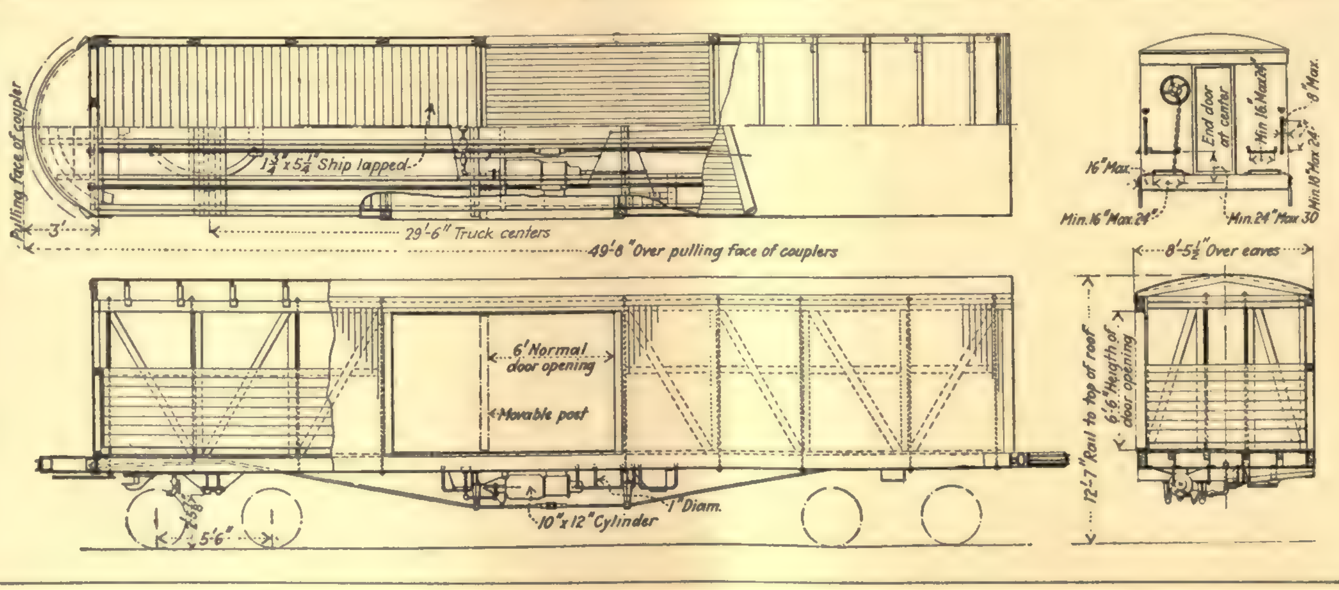
The inspection certificate shall be forwarded promptly to car owner together with list of material required to be furnished by the owner, with shipping directions. The car owner shall promptly inspect, if he so desires. If plans or specifications are required they shall also be requested. Standard safety appliances must be completely applied.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—10

GENERAL DIMENSIONS OF THE C.E.R.A. FREIGHT CAR

Length over coupler pulling face	49 ft. 8 in.	Rail to center of coupler	2 ft. 10½ in.	Capacity	80,000 lb.
Length over buffer beams	48 ft. 8 in.	Rail to bottom of side sill	3 ft. 7 5/16 in.	Trucks	Four-wheel arch bar type
Length inside at corner post	42 ft. 4½ in.	Bottom of side sill to top of side plate	7 ft. 11 9/16 in.	Rail to center plate bearing surface	2 ft. 5¾ in.
Center to center of king pin	32 ft. 0 in.	Top of side plate to top of roof	0 ft. 12½ in.	Track gage	4 ft. 8½ in.
Width over side sills	8 ft. 3 in.	Floor to under side of carline at center at door	7 ft. 9 3/16 in.	Truck wheelbase	5 ft. 6 in.
Width over side sheathing	8 ft. 4⅝ in.	Rail to top of roof at center	12 ft. 7 in.	Journals	5 in. 9 in.
Width inside	7 ft. 6⅜ in.	Height of door opening	6 ft. 6 in.	Brakes	Inside hung
Width at eaves	8 ft. 5½ in.	Width of door opening	10 ft. 0 in.	Radius of sharpest curve at center of track	35 ft. 0 in.
Extreme width	9 ft. 0 in.				



Association News & Discussions

Reproduction Cost Unsatisfactory as Basis for Rate Making*

By Hon. Lewis Goldberg
Commissioner Massachusetts Department of Public Utilities

NOWADAYS the reproduction theory is sweeping the minds of the utility owners of the country and making them feel that at last the panacea has come if they only can have rates established on a reproduction cost basis. As generally understood, the reproduction theory is that, in determining what the base rate for a utility should be, you determine the value of the plant on a reproduction basis, with costs of labor and materials projected into the reasonable future, minus observed depreciation; guess whether the plateau of prices will remain more or less on a level or whether they will go up or down; take into consideration the original cost and the historical cost; add assumed costs of organization, engineering and supervision; add theoretical costs of financing and interest during construction; and take into consideration such other factors as may seem to be pertinent. Just take all of these factors and such other factors as may be pertinent and jumble them all together and assume that this reproduction theory will furnish what you would like to have the rate base to be; and if it doesn't give you the desired result, get a new theory.

Is Not Sound Business

Now, as business men, if someone told you that the value of your respective plants was based on any such scheme as that, you would laugh them to scorn. The fact is that when plants are sold, the managers and owners of the utility selling out do not give the slightest thought to what the reproduction cost would be; nor do the managers or owners of the combination buying the utility give any thought to what the reproduction value would be. It may be, from an economic viewpoint, that is a fair test as to whether the reproduction theory has any value.

You look at your book assets, you inspect your earnings sheet, you examine your operating expenses, you want to know how depreciation has been taken care of, and you look at the plant as it is and not at some fanciful theoretical plant which might be reproduced in exactly the same manner as this plant now exists. It is unsound because it is not businesslike from that point of view, and further because it is not true to fact, because never in this business world would any plant be reproduced as it is if you were going to build it from the ground up. There is no plant that would ever be reproduced from the ground up just as that plant exists today. To say that it would, involves the supposition that since the inception, or rather since the formation of your business, since the beginning of the construction of your individual plant, there has been no improvement in the art of that utility. It would be rather a sad confession to make for any utility to say that since its inception there has been no improvement, and it would not be true.

Untenable Assumptions Made

Let us take the electric utility for example. Is there any electric plant existing anywhere in this commonwealth today that would be produced stone for stone, foundation for foundation, building for building, generator for generator, transformer for transfomer, just as that plant exists today? Why, of course, everybody knows it would not, and so your theory calls for the reproduction of something which would never be reproduced and involves taking into consideration the value of that which you would never buy today if rebuilding your plant.

For example, you have a garage which you use and which used to be a power house, and you have foundations for a power house. Under this theory you reproduce that garage with those foundations. You have a generator or a transformer which is almost passé so far as style and bodily improvement are considered. You are using it because it is still serviceable, but if you were going to buy another you would never purchase that type. Under the reproduction theory you would add the cost of reproducing that obsolete part of your plant and deduct observed depreciation, and observed depreciation is a very elastic term. I have heard experts testify that so long as the machinery is doing its work there is no depreciation, even though, if you were going to buy a new machine tomorrow, you never in this world would buy a machine like that; and that a building which is 50 years old is only 5 per cent depreciated for a rate case; for the payment of taxes its depreciation is about 90 per cent.

The reproduction theory, recognizing that there are certain things that can't be reproduced, is inconsistent with itself. It does not attempt to reproduce land, but it says we will take land at its present market value and not project it into the future as you do when you build your plant; not project it over a period of eighteen months or 24 months, whatever the period required for building a plant is, but your present market value, and we will take the prices of labor and materials and project them over this 24-month period needed for construction. Where is the consistency? Where is the consistency of taking one item on one basis and taking the plant on another basis? If a person is going to be inconsistent, he ought to be consistently inconsistent.

There is still one other inconsistency in the theory. They not only take the land at present market prices, they not only take the plant at a reproduction price projected into the future and attempt to calculate the labor and materials that go into that plant, and what the probable cost of that material will be over the period necessary for construction, and what the probable tendency of labor prices will be over that period, but with respect to certain of the assets they will determine a substitute for them, capitalize the cost of creating and operating this imaginary substitute for that particular part of the plant, and add this capitalized figure to the reproduction value. They say it would cost so much money to construct the substitute, the cost of operating it would be so much, and capitalizing this cost of operation and adding to it the cost of constructing the imaginary substitute, the result represents the reproduction value of that portion of the plant actually in use.

Cannot Determine Fair Rate

How does this theory work out in fact? Is it ever possible easily to determine whether a rate is fair or unfair? How can it be if under this theory the rate base is determined by the reproduction value, which in turn depends among numerous other factors on the future plateau of prices of both labor and materials? And so every rate case in such a situation involves an army of experts, involves intensive and expensive study, involves a considerable amount of time and a tremendous expenditure of money. And after you get all of that you haven't a collection of facts, but a collection of judgments of men, a collection of their guesses as to what is going to happen in the future.

This has been what the utility has to undergo in the ordinary rate case. Of course, the ratepayers have to pay for it. It is a part of the operating expense of the utility. How is the public going to meet such a case? Who of the public can afford or will undertake to expend the amount of money necessary to hire experts on the other side to make that same sort of a reproduction valuation? If that theory were carried out to its logical conclusion, there would in effect be no such thing as regulation of rates because the rates under such a rate base would be higher than those the utility could possibly charge the public and sell their commodity.

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*Abstract of address presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

Now, some utility men may say "Fine. You can't hurt our feelings by abolishing all regulation of prices." But you must have the public good will for the success of your business. No matter what the utility is, whether or not it is a monopoly, whether it is without any competition or whether it has some form of competition, if the public finds itself helpless to prevent constantly increasing rates in that utility, it will find a remedy for itself in other ways. The remedy for one thing will be a diminished use of the commodity; so diminished that the utility will receive less gross income under the enhanced rates than it would have received under the lower rates.

UNSOUND RATES BREED TROUBLE

But secondly, and what is perhaps more important, the public is a long suffering animal, it will endure a certain amount of, and perhaps a great amount of goading and prodding, but goaded too much and prodded too much, yoked to the utility that it is dragging, it will kick out its hind heels and smash that utility. The public is not helpless against constantly increasing rates. Monopolies exist in the utilities solely by virtue of the consent of the public; they are not inherent in the business. What is inherent in the business is the desirability of monopoly; the nature of the utility is such that from the viewpoint of efficiency and economic operation, it ought to have a monopoly. But if the aim or policy of the monopoly is exorbitant rates, that monopoly will cease to exist. Parallel or duplicate plants will arise by virtue of the repeal of the statutory laws which prohibit competition and municipalities will enter the field. That is not an untried feature, as you know. In Massachusetts we have some 44 municipal electric plants operated by the municipalities and operated profitably, and generally speaking the electric current sold by these municipal plants is sold at a rate less than the electricity which is sold by the private companies in the surrounding territory. Now if the utility should insist on reproduction value and demand rates upon that basis which will result, naturally will and must result, in rates which are very much in excess of those now complained of as being too high, and if the public is faced with the necessity of paying exorbitant rates or itself going into the business, do you, as business men visualizing the future, think for one moment that the public, having before it the example in our commonwealth of 44 municipal plants operating profitably and successfully, would hesitate to go into that business through the medium of its municipalities? Not for a single minute; and if you think for a moment that any legislature would dare to refuse the demand of the people to be permitted to enter into that business, you are mistaken. In view of that situation, the utilities should go rather slow before crying and cheering loudly for a reproduction theory valuation as a base rate.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 31-June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 9-11—Midwest Electric Railway Association, annual meeting, Hotel Chase, St. Louis, Mo.

June 13-16—National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.

June 15-16—American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.

June 19-23—International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.

June 20-24—American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.

June 20-24 — American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 29-July 1 — Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.

June 30-July 1 — Tramways and Light Railways Association, annual meeting. Bath, England.

July 22-23—Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Sept. 8—Central Electric Railway Master Mechanics Association, South Bend, Ind.

Oct. 3-7—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.

It is not always wise to insist on your rights. Utilities must be careful about insisting upon all their rights. They should take an object lesson from the epitaph which appeared on the tombstone in a certain cemetery. Inscribed on the tombstone was the following:

Here lies the body of old John Gray,
Who died maintaining his right-of-way.
He was right, dead right, as he rode along;
But he's just as dead as if he were wrong.

And we recall studying in our school days, in the subject of ancient history, about a chap named Pyrrhus who led an army against Rome. He defeated the Romans, but in doing so he succeeded in annihilating his own army. Some victories destroy the victor.

There is another economic angle. Take a plant that was built in the peak of high prices in 1918, 1919, 1920 and 1921, when we had the highest plateau of prices since the inception of the country, particularly the years 1919 and 1920, when the prices reached the top of the figure. Consider, for instance, a plant built during that period, and in 1935, if prices are then considerably lower and it is asking for certain rates, we say to that utility, "You will get rates based on your reproduction value, less observed depreciation. You built your plant at the peak of high prices. Your reproduction value today is 25 or 50 per cent less than what you paid for it, and therefore you will only be entitled to a rate based on half the capital which you invested in that plant rather than on your prudent investment."

What is going to happen to that utility if the theory is enforced? Can a plant in which is invested $10,000,000 operate if it is going to be allowed a return on only $5,000,000 of its capital stock? You know and I know it would not take very long for that utility to be in the hands of a receiver, and yet, under a strict adherence to the reproduction theory, all it would be entitled to would be a return on $5,000,000 instead of the $10,000,000 invested.

Or, consider a utility, and we have many such, that built the major portion of its plant since the war at high prices. Just now we have prices that are high, but what may happen ten years from now if there should be another downward tendency? Will that utility then be able to operate or to furnish adequate service? The reproduction theory would then cut its rates in half, which would mean a return on only half of its capital invested. But still more important, would it be fair to say to the shareholders of the utility, "You can't get a fair return on the money which you honestly and prudently and reasonably invested in your plant. You will get a return on only half of your cost because you can now build another plant for half."

It is merely the present moment with its high prices which makes the reproduction theory seem advantageous to utility owners. If in the future there should be a decided drop in prices, the utility owners will clamor just as loudly against the reproduction theory as they did in 1893 when it was first promulgated and they fought it tooth and nail. The reproduction theory creates an unstable situation, and a most unsatisfactory and unsound economic condition, because neither capital nor the public can look forward with certainty to the future.

It is not a fanciful situation that I have pictured. In 1914 there was a rate case involving a street railway before the department, and the reproduction theory was then discussed. Had the reproduction theory been put into effect in that case, the street railway, instead of obtaining an increase in rates which it sorely needed, would have had a reduction in rates, because the plant could have been produced for a great deal less than the actual investment therein; and it was only by the application of the so-called prudent investment theory that that street railway was enabled to receive higher rates and pull through. It would have had to close its doors and go out of business if the reproduction theory had been logically applied.

In this commonwealth, whatever might be said of some of the Western states, practically from the inception of public utilities there has been regulation with respect to investment in the utility. The company has received, generally speaking, dollar for dollar on its investment. There has been no water put into the stock; and so in this commonwealth, whatever may be the situation anywhere else, absolute fairness and equality of treatment both toward capital and toward the public require that, on the economic basis, the reproduction theory should be discarded and the prudent investment theory followed.

We have written into our law various things from time to time; we are endeavoring to write social justice into our law. Just now there seems to be the most vital need for writing into the law economic justice.

Causes of Radio Interference Analyzed*

By James Thompson
Signal Department, United Electric Railways,
Providence, R. I.

ABOUT a year and a half ago our first radio complaints were beginning to arrive at our office. For the first six months of that period we made no decided organized effort to eliminate this interference; in other words, we took the first man who was available and sent him out on the trouble. Results were rather indefinite as we made no check to find out if we had entirely eliminated the disturbance, and at that time we kept no complete records of these complaints.

During the past year, however, we have put our work on an organized basis. Complaints are received by letter, telephone and through the radio departments of other local utilities. The data obtained is immediately put on a regular "radio form" and a number assigned to this report. It is then forwarded to the inspector who has charge of this department and he takes up the complaints in that order. He is supplied with the necessary help and equipment to clear up any trouble which may be found in our transmission or distribution systems or communication apparatus, such as automatic signals, contactors, hand signals, switch lights, etc.

Test Apparatus Simple

The outfit used consists of a sectional bamboo pole with lead-in wire attached, voltmeter, ammeter and copper plate for grounding. With this equipment voltage or current readings are taken on spans, pull-offs or any other aerial apparatus which may be suspected of causing a leak to ground.

If you were to ask some of the good folks who live along our trolley system what station they receive strongest they would look at you with mournful eyes and say "The trolley! We can't get a thing on our set when the cars go by. Why, mister, we hear the car as soon as it leaves Jacks' Corners until it gets away down to Job's T.C. There it passes another trolley, which immediately starts back, and after it leaves Jacks' Corners we get about five minutes to hear our set, when another car starts from the corners." There you are—it's the same old story in the same old way. The only difference is the tone of voice of the complaint.

To date we have received no complaint that could be traced to our a.c. lines or substations. This, we believe, is because our lines are so well insulated and effectively maintained. Therefore, it is to be understood that the sources of interferences will be confined to the d.c. distribution circuits and the rolling equipment.

We have a simple theory by which to picture how this interference exists. It has been proved that an alternating current of electricity flowing through a conductor sends out lines of force which can be transmitted to another conductor insulated from it and cause a current to flow in the second conductor. This fact is made use of in the transformer when a current, flowing through the primary coils, induces a current in the secondary coils. This same effect can be produced in the second coil by interrupting a direct current passing through the first coil. Thus, we find that in order to have induction, it is not necessary to have an alternating current, but merely one that fluctuates; that is, one whose current and voltage values are constantly changing. For instance, if you have a grounded wire on a d.c circuit in an underground cable, or concealed in trunking where it is not very handy to get at, in order to locate this ground you would take one of the old type exploring coils and insert an interrupter, such as a common doorbell or buzzer, in this circuit. This would cause induction that could be easily picked up with the exploring coil and traced by carrying the coil parallel with the cable until the short was reached, at which time the fluctuations in this exploring coil would cease and you would know that you had found the particular spot where the short was.

The point is that the buzzer or interrupter in this circuit is analogous to the arc in the ground of our feeder, trolley wire or d.c. wires which may be found bare in trees or leaking through defective insulators to poles and then to ground. This sets up an oscillating current of a high frequency which travels along the line for a considerable distance and is a disturbance to radio sets which lie within 1,500 ft.

This arcing condition is not necessarily constant, but is more or less intermittent, and in most cases which have come within our experiences is aggravated by the presence of cars in the vicinity of the arc. This may be due to vibrations in the overhead construction or to the increased power consumed by the cars. Many times we find that it is worse when several cars travel close together or cars are pulling up grade rather than down.

Noises broadcast from the moving car we have termed "trolley pick-up." That may be a local expression, but, nevertheless, it serves the purpose of defining this particular type of noise. We have found this "trolley pick-up" due to three different causes.

First, we found that the moving car, drawing power, would be heard in the set while approaching several blocks away with a continual "crackling" noise. This noise would immediately cease as soon as the controller was thrown off and would start again with the application of power. This is affected by the type of roadbed and the amount of topsoil of this roadbed being tracked onto the rail by other vehicles. This tends to act as an insulation and causes the interruption of the return from the wheel to rail, causing an invisible arc which broadcasts. The same type of noise is also broadcast when several open bonds are in a given section.

Second, we have the "crackling" noise, as stated before, with approaching car under the same condition, but added to that "crackling" noise will be the hum of the motor pick-up from a low pitch to a high pitch, gradually ascending to a peak, and will stop immediately with the shutting off of power. This we find is caused by the combination of accumulation of dirt on rail with arcing brushes and poor rail bonding.

Depends on Type of Car

Third, when an approaching car is heard with just the pick-up hum of the motor or commutator, from a low noise, gradually ascending to a peak as the car gathers headway and no serious "crackling" with it. We found this type of noise to be confined to certain cars. All cars do not broadcast in this manner. Some of the older type of cars seem to give the most trouble.

To date we have not made any specific tests to remedy this type of trouble which we term "trolley pick-up." We believe the only remedy for this would be to equip the cars with condensers or some special apparatus made for that purpose.

We have had only 76 radio complaints to date and feel very proud of this fact in view of the large number of radio complaints received by the local lighting companies which also cover the territory. Of the 76 complaints investigated, we found that 40 per cent were due to leaking insulators and bare feed wire in trees, 25 per cent leaking caps and cones, 20 per cent trolley pick-up, 5 per cent local lighting companies and 10 per cent in owners' sets. You will note the very low percentage of set troubles found. This is because the local lighting companies receive most of the complaints of this nature and they have the trouble cleared up before the complaint reaches us.

Too much care cannot be exercised in

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*Abstract of a discussion presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

the selection of the man for this type of work. He must have at his command more than a technical knowledge of the situation. He must keep in mind, first and foremost, that he is building good will for his company through these relations and must be able to handle the public in a diplomatic and patient manner. He must be electrically inclined, with a good sound working knowledge of radio principles, and must be thorough and sincere.

Accidental and Intentional Radio Interference*

By E. F. Bickford

Electrical Engineer Eastern Massachusetts Street Railway

SOURCES of radio interference seem to be disruptive discharges of two sorts: (1) Accidental, such as are produced by sparking commutators and the many types of leaks or grounds and circuit interruptions, where characteristic "spark phenomena" are produced. These seem to consist principally of grounds on feeder wires in trees, broken rail bonds, defective contacts for automatic electric track switches and signals, and (2) intentional, such as the various kinds of vibrating contacts and rotating devices used for interrupting circuits according to some design or plan, such as sign flashers, automatic heating pads, mechanical storage battery chargers, ignition systems, electric auxiliaries to oil heating plants, etc.

In either case, these disruptive discharges may not only send out direct radiation, but may also cause high frequency current to be propagated along the connecting wires of the circuits, and they may set up oscillations in parts of connected circuits, which will radiate in the same way as an antenna. Extensive tests made by the American Electric Railway Association would seem to indicate that so far as street railway operation is concerned the class of disruptive discharges referred to above as intentional will not have any effect at a distance greater than 50 ft., and in many cases this effect is limited to 20 ft. or less with loop sets.

The greatest amount of interference to radio reception in the above classes is caused by the interruption of small currents; that is, currents of such small intensity that their interruption causes sparks rather than arcs. Interference from the ordinary heavy current flows over wires and tracks, if the circuits are in good condition, should be negligible.

The operators of radio sets in the vicinity of our turnouts are able to detect by the sound in the receivers when automatic track switches are thrown or signals are lighted and when they are put out, and in view of the fact that the lights in the signals are highly visible at night, whereas other electrical disturbances are not as evident, the radio "fan" has immediately jumped to the conclusion that our signals were the cause of all his difficulty. The actual disturbance, however, due to the signal, itself, is of an instantaneous character and should not cause the radio operator any more disturbance than the ordinary switching on and off of the light circuits in his house, which is accepted as a matter of course.

The so-called disruptive discharges under the head of accidental are, of course, avoidable or subject to immediate remedy. As soon as any defects in our system come to our attention, whether it is signals, arcing motors, trolley wheels or tree grounds, broken bonds, etc., they are immediately corrected, and if we are maintaining our equipment in a reasonably good condition it is then strictly up to the radio fan to put in a type of apparatus and to so install, maintain and operate it that it will give him the quality of service he feels entitled to.

At a recent conference with a representative of one of the larger local lighting companies I was advised that its investigations disclosed that most of the sources of complaints originated on the premises of the complainant, either in his local house wiring or in his radio outfit or in the various household electric utilities, the final remedy for which was strictly up to the property owner or the owner of the radio set.

One of the principal causes of trouble to the radio fan is the lack of precaution on his own part to use proper equipment and see that the same is installed in such a manner as to give him the greatest freedom from outside interference. Some of the older types of radio outfits, often referred to as "squeal sets," used generally for long-distance work, not only cause disturbances to themselves and their neighbors, but they are very sensitive to any disturbances, particularly as most of these sets are operated with head receivers.

Recently many people have tried with more or less success to increase their distance by using some form of "superhet," either factory made or of home construction. It is stated that less than 20 per cent of the attempts to construct this type of set result in satisfaction to the builder, principally on account of noise and interference, which cannot be cleared up, primarily originating in the set, but in part due to greater sensitiveness.

Where a broadcast listener attempts, through highly oscillating systems and extremely sensitive sets and an extensive outdoor antenna, to obtain great distance, he must expect to receive a much greater amount of noise and interference from the operations of other radio "fans," modern electric household devices and from the legitimate operations of the public utilities, who are giving a public service through their distributing circuits.

All complaints received are investigated and if we find anything wrong with our system it is promptly remedied, but in case we find nothing wrong or if nothing we can do clears up the situation, we advise the radio "fan" to that effect, and expect him to make such changes in his equipment as he may see fit to remedy the situation.

We keep notes on complaints received from the various divisions and we are often able to eliminate this company's responsibility entirely. For instance, if we have a complaint and at the same time we can find other persons who are in the same location who are having no trouble whatever, it is quite clear that the difficulty is not due to the public utilities or the broadcasting station, but is probably due entirely to the equipment of the complainant. I believe a large part of the difficulties now encountered, particularly with modern sets, is because the manufacturers, to please the general radio public, have reduced the controls to such an extent that the "fan" is often unable to make necessary adjustments in his equipment which would eliminate the difficulty.

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*Abstract of a discussion presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

C.E.R.A. Delegates to Travel by Boat

THE good ship *South American*, of the Chicago, Duluth & Georgian Bay Transit Company, is scheduled to leave Chicago on her first trip of the 1927 season on Saturday afternoon, June 25. After making her usual stop of several hours on Sunday morning at Mackinac and at Perry Sound in Georgian Bay on Monday, she is scheduled to reach Detroit about 9 o'clock on the morning of Tuesday, June 28. This will be just one day in advance of the Central Electric Railway Association convention, which begins on June 29 at Detroit. A number of delegates from Chicago and vicinity are planning to travel to the convention by this ship, familiar to all members of the association from previous cruises.

Development of Electric Car

IN A PAPER given before the Birney Club, St. Louis, on May 2, 1927, A. D. McWhorter, general superintendent Memphis Street Railway, outlined the development of car bodies from the time of the early horse-drawn vehicles up to the present.

In speaking of the use of steel car bodies, Mr. McWhorter said that the introduction of steel was not accomplished without serious opposition. First from those who were directly interested in the manufacture of wooden cars, and second, from those who were skeptical as to the advisability of adopting steel as a vehicle of transportation exposed to the action of injurious elements which might cause a rapid deterioration of the metal and a constant reduction of strength. Up to the present time no serious deterioration or reduction in strength has been noticed in the steel cars now in service. If proper attention is given to the method of construction, to the weight of metal used and to painting all parts thoroughly at the time of manufacture to protect them from corrosion, it is reasonable to expect an average length of service of at least 20 to 30 years from steel car bodies.

The latest development in cars provides for low-level entrance and exit, light weight, double trucks, a semi-noiseless construction and various refinements incorporated to provide comfort, convenience and safety to passengers. Comfortable and in many instances upholstered seats provide a measure of luxurious travel comparable to that afforded by the automobile; high candlepower lights also add to the pleasing appearance. Probably the most important part of present-day electric car operation is that of making car riding more popular by providing more attractive and comfortable transportation.

Efforts to Reduce Radio Interference Successful at Concord*

By J. B. Crawford
General Superintendent Concord Electric Railways

IN OUR experiences for the past few years with reference to radio interference the greatest difficulty we have found has been separating the wheat from the chaff. In other words, about 90 per cent of the radio troubles for which we have been blamed should not have been laid at our door.

During the winter of 1925 and 1926 radio reception was very poor and consequently irritating to the radio fans. The international transatlantic test scheduled for the last week in January was a complete failure. Static had seldom been worse. The telegraph companies reported an unusual number of natural electrical disturbances that at times put their long-distance lines out of commission. Some of this was blamed, with much plausibility, on the northern lights, which were unusually active that winter. No less an authority than W. D. Tyrrell, chief radio supervisor of the Department of Commerce, says that radio conditions were worse that winter than any winter since radio began. Mr. Tyrrell states that the real cause of these disturbances was sun spots. During January and February, he goes on to say, "several of these great spots, each of them large enough to engulf a dozen earths, could be seen on the sun's face with the naked eye. Still others were visible with telescopes." Mr. Tyrrell believes that this condition will probably continue for a year or two.

In Concord, as in other cities, the condition of apparent radio interference became so pronounced that a radio club was organized, and shortly after two experts were sent there by one of the radio manufacturing companies to assist in locating the troubles. Three autos, a large number of interested fans and radio dealers scoured the city in an effort to locate the elusive radio bug. This test was so unproductive that even the newspapers made fun of it, as witnessed by the following account:

"The trip included the various points of the city, but nothing definite was said concerning any discoveries. There seemed to be a vague aura of mystery surrounding everything. Typical of the testing is the following: Motor cars run up to a place, come to a stop. Business of general exodus from the cars. The portable set is carried to some point in the vicinity while everybody gathers around. The buzz is unmistakable.

First Man—"Sounds like the real thing."

Second Man—"That's just a natural disturbance from the motors."

Fourth Man—"Hear the little wave —ooom-ooom—like that?"

Fifth Man—"Sure. What is it?"

Fourth Man—"That's it."

Third Man—"It's local disturbance."

Sixth Man—"That's just the engineer inside shifting from one motor to another."

Second Man—"Hey, Charlie, what do you think of Northern Lights? Do they have any effect on radio?"

Seventh Man—"Possibly, but that doesn't cause this kind of disturbance."

First Man—"What would you say is the matter here?"

Fourth Man—"Oh, this is partly a local disturbance. The commutator and the carburetor probably set up an arc which sends out radio frequency waves. It's d.c., all right."

Reporter — "Just what does that mean?"

Fourth Man— "Not much."

Reporter—"But there is something that is causing a general disturbance?"

Fourth Man—"Oh, yes, indeed."

First Man—"Let's move down the road away and try it."

Everybody moves.

"When the survey is complete it is expected that it will be but a short while after that the noise which has been the bugbear of Concord radio fans will be eliminated."

It is my belief that most street railways are making every possible effort to eliminate causes of radio interference. At first it seemed rather a hopeless task. During the winter referred to we were very diligent in running down all troubles of this nature brought to our attention. In fact, we started in the fall of 1925 testing all rail bonds and replacing them with welded bonds where they failed to meet a selected standard. All trolley wires and feeders were cleared of ground leaks and poor connections. The high-tension lines were closely watched and all leaking insulators were immediately replaced. Graphite brushes were installed on our older rotary converters. In spite of all this, we still frequently have troubles causing real radio interference but difficult to locate.

Once we had a very bad a.c. disturbance which was finally located in an isolated transformer house. Some one had broken in during the summer months when the transformers there were not being used and had thrown in one switch of a three-phase circuit, thereby causing a current to jump across a telltale that had been installed to give information as to whether or not all three phases were working. This created a terrific roar. Of course the trouble was rectified immediately and there has been no trace of any disturbance from this source since.

Last fall we had a case of interference that was not so easy to locate. By a series of tests we eventually found the disturbance to be originating in a modern 500-kw. rotary converter. The armature of this converter had burned out last spring and been rewound. The machine was in excellent running condition with almost perfect commutation and we were unable to discover what was causing the disturbance. Therefore, we called on the manufacturer. He sent us one of his service men, who was also familiar with radio troubles and who finally located this noise. He found that by touching a grounded wire to the rotating shaft of the machine the interference was stopped. A copper leaf brush was rigged up and connected to ground through the frame. It was placed so as to touch the rotating shaft at all times. This has been an absolute remedy for the trouble and no further complaints have been made. The theory advanced by the engineer was that in some obscure manner a potential was built up in the rotating shaft. This potential increased until it reached a point where it could break through the oil film of the bearing and discharge to ground. This condenser action produced oscillations of radio frequency which were impressed on the windings of the machine and so transmitted over the system.

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*Abstract of a discussion presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

Electrical Engineers Elect Officers

BANCROFT GHERARDI, vice-president and chief engineer American Telephone & Telegraph Company, New York City, was elected president of the American Institute of Electrical Engineers at the annual business meeting held in the Engineering Societies Building, New York, on Friday, May 20. Other officers elected were: Vice-presidents: J. L. Beaver, Bethlehem, Pa.; C. O. Bickelhaupt, Atlanta, Ga.; O. J. Ferguson, Lincoln, Neb.; E. R. Northmore, Los Angeles, Cal.; A. B. Cooper, Toronto, Ont. Managers: F. C. Hanker, East Pittsburgh, Pa.; H. P. Liversidge, Philadelphia, Pa.; E. B. Meyer, Newark, N. J. National treasurer, George A. Hamilton, Elizabeth, N. J. (re-elected).

These officers, together with the following hold-over officers, will constitute the board of directors for the next administrative year, beginning Aug. 1: C. C. Chesney, Pittsfield, Mass.; M. T. Pupin, New York City; H. M. Hobart, Schenectady, N. Y.; B. G. Jamieson, Chicago, Ill.; George L. Knight, Brooklyn, N. Y.; H. H. Schoolfield, Portland, Ore.; A. E. Bettis, Kansas City, Mo., John B. Whitehead, Baltimore, Md.; J. M. Bryant, Austin, Tex.; E. B. Merriam, Schenectady, N. Y.; M. M. Fowler, Chicago, Ill.; H. A. Kidder, New York City; E. C. Stone, Pittsburgh, Pa. I. E. Moultrop, Boston, Mass.; H. C. Don Carlos, Toronto, Ont.; F. J. Chesterman, Pittsburgh, Pa.

The annual report of the board of directors, presented at the meeting, showed a net increase in the member- during the year of 186, the total membership on April 30 being 18,344. In addition to the three national conventions of the institute and five regional meetings, there were 1,273 meetings held by the local organizations.

American Association News

Committee on Bus Operation

AN ANALYSIS of the progress made on sub-committee reports and to a discussion of the basis of bus fares occupied a large part of the time during a meeting of the committee on bus operation, held at association headquarters in New York on May 23. The following members were present: Paul E. Wilson, sponsor; A. R. Meyers, sponsor; C. H. Chapman, S. W. Greenland, and Adrian Hughes, Jr.

There was some difference of opinion as to whether bus rates should be established so that the costs of operation would be borne directly by those using the service or whether it should be merged with the total cost of transportation in the city and carried by the system as a whole.

Mr. Wilson was of the opinion that the situation regarding the proper basis for bus fares is rapidly changing and that a new conception of this matter should be brought out. He held that bus rates when originally established were designed to meet emergency conditions; that they were not fixed by the economics of operation but by the exigencies of the conditions encountered, such as the threat of competition and the general lack of knowledge regarding operating costs. He held, further, that the very flexibility of the bus increases the pressure which is exerted for extension, and that unless bus operation is put on a sound economic basis, where at least a large part of the service will stand on its own feet financially, there is danger of burdening any given company with a constantly growing financial load that tends toward a general rise in the fare level. He did not consider it fair to burden the established car rider whose place of residence and business were selected so as to be convenient to existing transportation facilities with the cost of establishing new transportation to undeveloped communities where property values are considerably lower.

Mr. Hughes was of the opinion that any effort to establish new bus routes on a basis to make them carry entirely the costs of operation was impracticable. He felt that the extension of service by buses is part of a given company's responsibility to render a complete service to its community and considered that the extension of service by buses is comparable to the extension of rail service, and costs should be carried in the uniform fare.

Other members of the committee joined in the discussion of various angles of this subject and it was felt by the committee that the inclusion of such a fundamental discussion in its report would be timely and of great value to the industry. Mr. Wilson asked Mr. Hughes to outline his views on the subject in writing in order that they may be available in the preparation of the report.

Way and Structures

A FINAL meeting of the way and structures committee will be held on June 9 and 10 at A.E.R.A. headquarters, New York City, at 10:30 a.m., Eastern daylight saving time. Chairmen of all special committees are invited to attend this meeting. The importance of having as many reports as possible in shape for submission at that time is urged upon each chairman.

New Engineering Manual Out

THE second republication of the Manual of the American Electric Railway Engineering Association in bound-book form has just been sent out. This is revised to Dec. 31, 1926, and follows the general arrangement of the 1923 edition in bound-book form. Previous to 1923 the Manual was published as a loose-leaf volume.

Material is grouped into eight general divisions which follow the principal phases of the Engineering Association's work and in each division the manual sections are classified according to three grades: standards, recommendations, and miscellaneous methods and practices. The title page and table of contents is divided so as to make each division complete in itself. Each division is published separately.

Under the system put into effect in 1923 the manual is completely republished in bound-book form at the end of every three-year period. Any new sections which may be approved in the two years immediately following such republication are printed in full in the supplements of these years.

Co-operation with Manufacturers

A MEETING of the committee on co-operation with manufacturers was held at association headquarters in New York on May 13, 1927. The following members were present; E. F. Wickwire, chairman; M. B. Lambert, vice-chairman; F. L. Blanchard, Mr. McCormick representing H. B. Doyle, George Frey, Mr. Bodine representing H. J. Kenfield, G. R. Rowland, L. F. Stoll and E. P. Waller. J. W. Welsh and Labert St. Clair of the association staff also attended the meeting.

The chairman reported the figures on the distribution of the traffic congestion booklet, and after discussion it was decided to send another follow-up letter, each member co-operating by sending out a letter to an assigned list of names. The advertising section was authorized to offer manufacturer members two posters and two stickers which have been prepared for use on freight and express packages. Other posters and stickers dealing with safety and traffic congestion were approved.

It was decided to issue two booklets some time before the annual convention, one of which will deal with the influence that modernized equipment, courtesy and other details have on the sale of car rides. The other will be written for salesmen in the industry to show how they can be helpful to operators in the way of getting business. The advertising section will also be requested to prepare some interviews for the use of salesmen on the general local transportation situation throughout the country.

The committee plans to make a special effort before and at the convention to interest visitors in the electric car exhibit. All manufacturer members will be asked to visit the car exhibit and to take visitors with them. In addition, editors of trade papers will be asked to run editorials prior to the convention urging every one to visit the car exhibit.

Special Reports in Preparation

FOLLOWING is a list of special reports being prepared by the Bureau of Information and Service of the American Electric Railway Association. They will be available to member companies upon request:

Bulletin No. 138.—*Electric Railway Operations,* 1926.—Contains a combined statement of the revenues, expenses, net revenue, passenger traffic and car miles operated of 353 electric railways and 138 affiliated bus undertakings in 1926 compared with 1925. It also gives a complete comparative income statement and analysis of operations of 231 railway companies, classified into city, interurban and combination city and interurban companies and each group is further classified into three smaller groups according to the size of the companies. For each group there is shown a complete income statement, detailed operating expenses, operating statistics and derived ratios and unit figures for comparison.

Bulletin No. 139.—*Bus Operations of Electric Railways in* 1926.—A summary and analysis of the bus operations of 135 electric railways. The reports of the individual companies are tabulated, and certain of the more important items are shown on a unit basis to permit a more accurate comparison. The reports tabulated include a complete income statement, details of operating expenses, statistics of operations and complete data on the number, types and seating capacities of buses operated.

Bulletin No. 140.—*Promotion of Safety by Awards to Trainmen.*—A study of the methods adopted by various companies to promote safety by means of the payment of a bonus, or the granting of some other award or distinction, to trainmen for good accident records. All of the methods adopted for this purpose have been examined and classified into certain types, and a complete list of companies that have established systems of awards to trainmen has been prepared and classified under the several types of awards. A complete description of the system in effect on each property is also given, together with statistics on their accident records to indicate what, if any, effect the system of awards has had upon the number and cost of their accidents. There is also included expressions of opinion by executives as to the value of award systems on their respective properties.

Bulletin No. 141.—*Miscellaneous Factors Affecting the Working Conditions of Electric Railway Trainmen.*—A compilation of information covering a number of miscellaneous provisions, such as insurance and sick benefits provided, period of training required for motormen, conductors and one-man car operators, pay received during period of training, number of trainmen, total payroll and labor turnover in 1926 and also the proportion of trainmen belonging to the union.

Bulletin No. 142.—*Miscellaneous Factors Affecting the Working Conditions of Electric Railway Bus Men.*—Gives for bus operations of some 132 companies the same information regarding life insurance, sick benefits, period of training required, pay received during training and statistics of employees, as is given for electric railway trainmen in Bulletin No. 141.

In addition to the above the following supplements have been prepared, bringing the information they cover down to May 1:

Supplement No. 20 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 2 to Bulletin No. 129, Wages of Trainmen.

Supplement No. 2 to Bulletin No. 130, Wages of Bus Men.

Cost of Living Studies (Bulletin No. 143).

The News of the Industry

Pennsylvania's Newark Plans Announced

Mayor Thomas L. Raymond of Newark, N. J., received on May 24 the Pennsylvania Railroad's plans for its proposed improvements in that city. These include the construction of a new passenger station on the north side of the Pennsylvania Railroad tracks between Market and Canal Streets. Upon the completion of these new facilities Manhattan Transfer will be abandoned. The railroad agrees to make these improvements in connection with arrangements between the city and Public Service Corporation, providing adequate transit facilities.

The western half of the Pennsylvania's new station will be used by passengers for local and main line trains and the eastern part will be used by passengers for the rapid transit service to Jersey City and downtown New York, provided jointly by the Pennsylvania and the Hudson & Manhattan.

The station will be served by eight tracks, six for Pennsylvania Railroad trains and two for the rapid transit trains. There will be six platforms. Seven of the tracks and five of the platforms will be placed approximately at the level of the present tracks, and one track and one large platform will be constructed about 18 ft. above the present track level. This upper track will be used by westbound rapid transit trains. The unloading platform will be 50 ft. wide, to accommodate the large number of passengers arriving from downtown New York. Two ramps will lead from this platform to the street level and other ramps will descend to the westbound main line island platform immediately below. This will provide easy access to the proper platform for westbound Pennsylvania Railroad passengers.

The main station area, including the new building on the north side of the elevated railroad, will extend under the tracks and platforms.

$250,000,000 of Property Involved in California Rate Cases

The California Railroad Commission now has pending before it an extraordinary number of important proceedings relating to service and rate conditions on transportation utilities in California, and especially those involving local and interurban transportation in the larger cities. In this respect the state body is confronted with serious problems of this nature in every large city of the state, and the value of the railroad properties involved totals upward of $250,000,000.

As a result the commission has decided to investigate the manner in which cities in other states, and their transportation utilities, have met these problems and has directed A. G. Mott, its chief engineer, to go East for the purpose of studying these and other important public utility matters. Mr. Mott left on this mission on May 23 for an extensive tour and is expected to return during the first week of July.

The chief engineer will study the local transportation conditions in all of the cities that he visits. He will also study steam railroad freight and passenger terminal situations in such cities as Chicago, Washington, Philadelphia and New York.

Under instructions of the commission, Mr. Mott will also inquire about the practices and service of some of the more important electric power utilities.

Among the major transportation cases pending before the Railroad Commission at this time are the applications for rate and fare increases on the Key System Transit Company, Pacific Electric Railway, Los Angeles Railway, San Jose Railroad, Peninsular Railway, Sacramento Street Railway and Stockton Electric Railway.

Unification Inquiry Under Way

Commission Starts Public Hearings After Failure of Private Conferences—Counsel for State Body and Head of Brooklyn Corporation in Disagreement Over Reasons for Failure of Negotiations

NEW YORK'S new transit inquiry has got under way. As was to be expected, Samuel Untermyer, special counsel for the Transit Commission, has succeeded in making first page news out of the proceedings not so much by what has been brought out as by the way it has been brought out.

The inquiry, of course, purports to be a fact-finding proceeding on the part of the commission, conducted in open form fashion for the purpose, apparently now submerged, of discovering ways toward traction unification. It has been ushered in with the obviously irrelevant question of the ownership of stock of the Interborough Rapid Transit Company and comments from counsel on the stock as a football of speculation.

For thus diverting attention from the main issue Mr. Untermyer has been called to account in the daily press, the *Wall Street Journal* asking where else than in Wall Street any one would expect to find the stock. As that authority sees it, the stock is not an investment and has not been one since the company took over the bankrupt Metropolitan Street Railway nearly a score of years ago. It says that investors long ago took their losses and retired from an enterprise which, after brilliant entrance into its own field of long-distance transportation, had sadly blundered in its first plunge into "unification." It says:

> Certainly Mr. Untermyer does not harbor the delusion that either the ownership or the market price of the stock can have anything to do with the terms on which the city may or may not take over the company's property. But the divertissement with which the play opens is far from a waste of time, from Mr. Untermyer's point of view. It creates the invaluable atmosphere, or haze, through which the public may see the traction Caliban struggling desperately to free itself from Ariel's magic spell. Facts really bearing upon efficient transportation service, the value of the properties and the expediency of recapture can, if necessary, be brought upon the stage in the fifth act.

The almost unending details seem to have no place, certainly at this time, in an account such as this. But what is it all about? Well, the gist of the matter is that the Transit Commission has begun the series of public hearings in the hope of obtaining information and suggestions which will assist it in drafting a plan for the unification of the rapid-transit facilities of New York City. It is required by law to prepare such a plan. In advance of its public hearings it undertook to reach some basis of understanding with the companies by a series of private conferences. These were barren of results and served only to emphasize the many points of difference in the views of the negotiators.

The only possible relevancy of the questions of counsel with respect to ownership and stock values is that the latter is said to have been the chief obstacle to progress at the recent conferences. As has been pointed out, the task is made doubly difficult by the fact that any plan which is finally devised much be accepted by both the companies and the city. The commission is a state-created body, with no power in this case other than to investigate and to recommend. As the *World* sees it, unification cannot be effected through its agency unless all parties show a disposition to give and take; nor can it be accomplished if the transit question is again to be bedeviled with politics as it was under the Hylan régime. "The job, in short, cannot be done unless there is a vigorous display of common sense all around."

Announcement to this effect that the private conferences had failed was made on May 11 by Mr. Untermyer. He declared that the Interborough wanted the city to take over the Manhattan elevated lines, which it holds on a lease, but which do not pay, and that the B.-M.T. expressed its willingness to dispose of its surface lines to the municipality but wanted a guarantee of its earnings in perpetuity. Mr. Untermyer intimated that the companies were unreasonable in their demands. Recapture seemed to be the only answer, he said, if the companies remained in their present mood.

Gerhard M. Dahl, chairman of the board of directors of the Brooklyn-Manhattan Transit Corporation, said in reply that the negotiations between the B.-M.T. representatives and the special counsel of the Transit Commission were terminated by the latter. According to Mr. Dahl no valuations by the Transit Commission where shown or offered, nor was any plan suggested, excepting a determination to split up the B.-M.T. properties in order that the city might purchase such part as it might choose at some knock-down price not stated, without any intimation as to how or when the city could pay even for that. Mr. Dahl said:

> The function of the Transit Commission, as set forth in the law enabling it to act, and as again emphasized in its public letter of Dec. 13, 1926, namely, to formulate a plan for the unification of all transportation systems with a fair return to the companies and a fair return upon the city funds invested, was at no time permitted by counsel for the Transit Commission to enter the discussion.
>
> The B.-M.T. is now and always has been willing and anxious to do all in its power for the improvement of the transportation facilities of the city. There is, however, little encouragement in prospect so long as those acting for the Transit Commission refuse to consider real unification or feasible methods to improve the service or a fair return upon the fair value of the investments in the property, both by the companies and by the city.
>
> We have been at all times and are now willing to agree upon a fair value of our property and a fair rate of return upon that value regardless of securities issued or stocks outstanding and market or any other values.

At least one witness has proved refractory about answering questions deemed to be irrelevant, and on May 26 the authoritative statement was made that the commission and its special counsel will make a test case out of Thomas L. Chadbourne's refusal to answer. On advice of counsel Mr. Chadbourne declined to answer questions relative to details of his purchase of Interborough stock. He wants to go to Europe, and for that reason was called as a witness out of the scheduled order of the inquiry. If the commission decides to test his right of refusal while he is away, service will be made by agreement on his counsel.

All in all, the first week's hearings have developed little bearing on the central purpose of unification. It is, however, generally agreed, as the *Times* points out, that they have served to bring out one rather significant declaration. It has been widely believed that the companies' attitude toward valuation would be rather unbending, particularly in the light of recent court decisions stressing reproduction costs as the principal criterion of value. But ex-Governor Miller, counsel for the railway, at the outset made it clear that the B.-M.T., at any rate, had no preconceived notions on the subject and would listen to reason. He declared that his client would even be willing to submit to arbitration to secure a proper determination of the matter. That may have been a gesture, but at least it was a gesture in the right direction, for agreement on a valuation of the companies' properties offers one of the principal difficulties in the present negotiations.

Meanwhile, the hearings have been put over until May 31.

Fare Hearings in St. Louis Started—Valuation Case Deferred

The hearing on the application of Receiver Rolla Wells of the United Railways, St. Louis, Mo., for a flat 8-cent fare opened before the Missouri Public Service Commission at Jefferson City on May 17. City Counselor Muench has indicated a desire to present his testimony at a hearing later.

Before any testimony was offered Mr. Muench asked that the commission make it clear whether the matter would be confined merely to a question of the rate to be allowed the company or if the entire subject of valuation would be again discussed. He said that the city opposed a new valuation as one was practically completed in 1923 and the car riders of St. Louis should not be subjected to the great expense of a new valuation. It was his contention that the logical way to proceed to a basis on which to predicate a new fare was to take the 1919 valuation of $51,781,000 and add betterments and additions made since that time.

Thomas E. Francis, counsel for Mr. Wells, said that the fare application was not presented nor urged on the valuation theory, but is predicated upon the view that an 8-cent rate is necessary to earn a fair return upon the money invested, pay taxes and operating expenses.

Among the early witnesses presented by the company were W. B. Bennett, consulting engineer for the company; Albert S. Richey, Worcester, Mass., and Robert M. Fuestel, Fort Wayne, Ind., engineer and operator of public utilities. These witnesses testified as to the present physical condition of the company's properties so that the units established by the 1919 valuation might be used as a basis for establishing the worth of the property as at present.

The theory on which the company is building up its testimony is that the commission in conformity to a recent decision of the United States Supreme Court should allow the utility to earn on the basis of the reproduction cost of its properties new less depreciation. A maximum valuation claim of $100,000,000 less depreciation of 16 to 20 per cent would bring the value of holdings, exclusive of non-operating properties, to not less than $84,000,000. However, it does not expect the commission to allow this maximum figure and would be content with a valuation of $75,000,000 as basis for figuring rate of return. Its application to the commission contended that the fair valuation of its operating properties was $75,000,000 and that was the figure used when the fare question was before the federal courts a few months ago. It is $15,000,000 more than the reorganization committee has stated it would accept if the city would grant a new franchise to it.

On May 16 accountants for the Public Service Commission completed an audit of the betterments and additions made during the last two months of 1926. It brings the total since Jan. 1, 1919, to $6,425,943. Depreciation for this period was estimated at $8,469,729, being subdivided as follows: Way and structures, $4,064,376; power and plant, $910,643; equipment, $3,480,517; bus equipment, $14,201.

Recently the commission appraised the property at $58,177,260.

Electrification Plans of New York Central Divulged

The New York Central Railroad will develop power in its own generating stations at Yonkers and Port Morris to supply its contemplated electrification on the west side of Manhattan Island, according to statements made by railroad officials to the press. Between 30,000 kw. and 40,000 kw. will be required for track now being electrified between Spuyten Duyvil and 72d Street. Plans for electrifications below 72d Street are still under discussion.

At the present time the New York Central has two power stations in the New York district. The largest of these is at Port Morris, in the Bronx. Here 70,000 kw. can be generated, and the major portion of the energy needed for the passenger lines of the company running north out of the Grand Central Station is supplied from this station. The second power station of the company is at Yonkers, where there is a capacity of 20,000 kw. This plant will be doubled, the new equipment being added probably within two years.

The railroad does not, it is announced, expect to purchase any power from the local companies for any part of its extensive electrification program. Current will be fed to the lines of the railroad on the west side from three substations, each with a capacity of 5,000 kw. These stations will change the current from 11,000 volts alternating to 600 volts direct. One of these substations will be at Dyckman Street, another at 133d Street and a third at 66th Street.

The electrification of the west side line of the New York Central has been the subject of negotiation between the railroad and the city for a long time. In the present instance the work is being combined with the elimination of numerous grade crossings.

New York State Men Vote Against Wage Renewal

Employees of the New York State Railways in Utica, Rochester and Syracuse in joint balloting on May 25 voted down by a majority of 133 the proposal to renew the existing wage and working agreement with the company. Bargaining was resumed between James F. Hamilton, president of the railway, and union officials. Another vote may be taken on the same proposal before resorting to arbitration. The employees voted twice last year on the same proposition before accepting it. It was stated that the vote in Rochester favored renewing the present contract, while Utica and Syracuse, where fares have been increased to 10 cents, cast the ballots that led to its defeat.

The present wage scale is 55 cents for two-man car operators, 58 cents for one-man operators and 60 cents for interurban men. The men had asked for a 9-cent an hour straight increase. The company contends employment conditions and high cost of maintenance preclude any wage increase.

Chicago Rapid Transit Employees Renew Wage Demand

Hearings on the question of a wage increase of 15 cents an hour for 5,000 employees of the Chicago Rapid Transit Company were scheduled to begin this week, following presentation of a formal demand to officials of the company by Frank E. Lawrence, president of the Chicago elevated division of the Amalgamated Association. The present wage ranges from 72 to 77 cents an hour under an agreement which expires May 31. Although official announcements have not been made, it is understood that the company, instead of entertaining the demands of the union, will seek a reduction in wages and will also negotiate for changes in working conditions.

Similar demands upon the Chicago Surface Lines are momentarily expected from 15,000 platform and other employees. Since June 1, 1926, the Surface Lines employees have been working without a contract, as they failed to reach an agreement with the company at that time, when, together with the elevated workers, they demanded an increase of 5 cents an hour. 72

Survey Recommends Changes in Birmingham Traffic

Recommendations looking toward a solution of the traffic ills in Birmingham, Ala., have been forwarded to the City Commissioners as a result of an intensive survey conducted by Ross W. Harris.

Among the changes sanctioned by the city commissioners was a complete rerouting of car lines of the Birmingham Electric Company so as to distribute more evenly the loads carried by certain streets, prohibition of any parking on Second Avenue from Eighteenth to 21st, and the abandonment of Avenue C and Terminal station. The date when these changes are to go into effect has not been settled, but the commission plans to set a "zero hour" when all changes will be made on a certain day. Ordinances providing for the changes have already been drafted by Mr. Harris and City Attorney W. J. Wynn and submitted to J. M. Jones, Jr., president of the City Commission.

J. S. Pevear, vice-president and operating head of the Birmingham Electric Company, said that orders for new track, curves and other necessary facilities for carrying out the utility's part of the suggestions had been placed. The work of placing trackage to facilitate the rerouting will begin as soon as the orders are filled.

Commission Hopes for Adjustment in Buffalo

Under a plan advanced at Buffalo, N. Y., the Public Service Commission will consider not only the fare question, but track reconstruction and other matters in the transit situation over which there have been differences of opinion between the International Railway and the city. It is understood that after a program has been prepared, the commission will submit its proposal to the city and company for criticism. If overtures to act as arbiter in the matter are rejected, it is said that the commission will render a decision itself.

It is pointed out that not only must the commission consider the fare case by itself, but that it must view all angles of the situation. These include the city's application for an order to reconstruct many miles of roadbed, the counter application of the company for a rehearing of the Grant Street case, inasmuch as the city has moved to revoke the franchise. A commentator said:

> In viewing the proposition as a whole, it is likely that the commission will insist upon a track reconstruction program. Whether this will involve an increased fare is uncertain. It depends upon additional studies being made of the company's financies by commission experts.
>
> It is probable that in taking a comprehensive view of the matter, the commission also will give thought to the company's application to abandon portions of certain car lines and to substitute buses.

Amended Fare Schedule in Los Angeles Authorized

In a supplemental order the California Railroad Commission has authorized the Pacific Electric Railway to amend on one day's notice its experimental rate schedule, now in force between Los Angeles and points on its Glendale-Burbank line, as follows:

1. Publish between Los Angeles and Cypress Street a 30-ride family commutation fare of $3.25.
2. Reduce the present 30-ride family commutation fare between Los Angeles and North Glendale from $4.80 to $4.50.
3. Publish between Los Angeles and Pacific Avenue a 30-ride family commutation fare of $4.50.
4. Publish between Los Angeles and Allen Avenue a one-way fare of 20 cents, round-trip fare 35 cents, and 30-ride family commutation fare of $4.80; between India Street and Allen Avenue a one-way fare of 15 cents, round-trip fare 25 cents, and 30-ride family commutation fare $3.60; between Richardson and Allen Avenue a one-way fare of 10 cents; between Glendale (East Broadway) and Allen Avenue a one-way fare of 10 cents, and between Arden Avenue and Allen Avenue a one-way fare of 6 cents.
5. Publish between Cypress Street and North Glendale and between Cypress Street and Hahne a one-way fare of 6 cents.
6. Eliminate from the tariff all one-way, round-trip, 30-ride and 60-ride fares now published between Los Angeles, India Street, Richardson, Glendale (Broadway) and Glendale (East Broadway) on the one hand, and on the other Senorita, and between Los Angeles and Western Avenue.

Aurora Line Publishes Booklet for Suburban Home Seekers

Advantages of a home in one of Chicago's many beautiful western suburbs and the convenience offered commuters by its high-speed electric train service are among the features set forth in an attractive pamphlet recently published by the Chicago, Aurora & Elgin Railroad, Aurora, Ill. Information regarding educational and religious institutions, shopping, banking and recreational facilities, public utility services in every community along the railroad is contained in the 23-page booklet, which is entitled "Facts About the Western Suburbs and the Fox River Valley." It is illustrated with numerous pictures of scenic points in that territory.

The booklet is addressed particularly to the city dweller who desires to make his living conditions better. It is being distributed through hotel information desks, newspaper service bureaus and at all stations of the railroad.

New York Interurban Satisfies Needs of "Fans"

Offering the baseball enthusiasts of Jamestown, N. Y., and adjacent communities an opportunity to witness some of the major league baseball games played in Cleveland, Ohio, at a special excursion rate of $3.75 for the round trip is one of the many moves of the Jamestown, Westfield & Northwestern Railroad to stimulate its revenue.

Several years ago this line operated its first Sunday excursion to the Ohio city. For the initial trip more than 2,000 persons purchased tickets. Similar excursions have been operated at regular intervals since and the company now makes a regular feature of these excursions during the early spring and summer months.

The Jamestown, Westfield & Northwestern has its northern terminus at Westfield, N. Y., where it connects with the main line of the New York Central Railroad. Every available car of the former is pressed into use on these feature excursions. On reaching Westfield the passengers are transferred to a special steam train on the Central tracks, whence they are transported to Cleveland, without further stops.

The regular one-way fare between the two cities via the route mentioned is $5.34. The cars are started out of Jamestown in the early hours of Sunday morning and the return trip is made late the same evening. Due to the low-peak hours the excursions are operated, there is little or no interference with regular passenger travel and even though the reduction in rate is exceptional, both the trolley line and the steam line are enabled to increase their revenues.

The first excursion of 1927, advertised in the local newspapers for several days preceding, was on May 15.

Settlement Sought by Company at London

The London Street Railway, London, Ont., has agreed to relay its tracks in London West with new steel rails on steel ties and a concrete foundation. It has also agreed to install a passing switch and a loop or a three part "Y" in a suitable location. The company's acquiescence in this matter is contingent upon the passage of the following by-laws by the City Council:

> (1) Amending by-lay 916, authorizing the 5-cent fare in place of the seven and nine tickets for 25 cents as provided under subsection D of section 25; (2) a by-law amending by-law 916, granting the right to the company to operate ten additional safety cars, or a total of fifteen safety cars, with one employee in place of using two employees on each motor car as provided for under subsection H of section 25; (3) a by-law covering relief from the cost of paving the track allowance as provided for under section 10 of by-law 916, except that the company pays for the cost of laying the concrete foundation under the ties up to the normal line of paving.

According to Manager L. Tait, immediately after the passing of the necessary by-laws and their acceptance by the company, orders will be placed with the steel companies for the steel rails, ties, and the special trackwork required and the work it is estimated can be started within five weeks after the placing of the orders for the materials.

Proposal for Use of Canal Bed in Newark

A definite proposal regarding the financial arrangements between the Public Service Railway and the city of Newark, N. J., for the use of the Morris Canal bed as a rapid transit line was contained in a letter written by T. N. McCarter, president of the railway, to Mayor Raymond and recently made public. Mr. McCarter suggests that the city at its own expense and at an estimated cost of $4,000,000 prepare the canal bed for its subway use and also erect under the proposed new Pennsylvania station an adequate and up-to-date terminal station with all the necessary equipment, including track space, platform and escalators. His plan stipulates that a lease be entered into with the Public Service Railway under which that company would pay to the city 5 per cent of the gross revenue derived from operation of the subway line. Besides, according to the letter, the Public Service Railway would be willing under this plan to expend approximately $850,000 for making the necessary connections to the existing Public Service line, equipping the subway structure when completed with rails and overhead construction for operation. It was further proposed that the railway would be willing to finance the $4,000,000 expenditure with the understanding that the annual carrying charges on that sum be deducted from the 5 per cent tax to be made to the city by the companies.

Mr. McCarter said that he was confident the development would increase the traffic, "resulting, therefore, in substantially increased payments to the city under the 5 per cent tax requirement, which extra payment will constitute the rental to the city for the privilege."

Justifies Ventilation System in Toronto

The Toronto Transportation Commission declared that its ventilating system can exhaust air faster than a throng of 3,600 people jammed in Massey Music Hall could breathe it out from their lungs. In the *Coupler*, under date of May, 1927, referring to the publicity given during the past month to the provincial health law limiting the number of passengers to be carried by a street car, the commission stated that when it realized that poor ventilation was a menace to Toronto's citizens more than $100,000 was spent installing efficient ventilating systems similar to those used in the new steel cars. When the commission took over the system six years ago and adopted the motto "Safety, Courtesy and Service" it was concluded that safety should not only include prevention against accidents but also against germs. Thus it was that every street car order was designed so as to provide the best of ventilation. The commission states that it makes no attempt to conceal that at times, particularly on rainy days, cars may have slightly unpleasant odors, emanating from the wet clothing of passengers. However, it claims, it would not be possible to arrange a ventilation system which would eliminate these odors.

News Notes

Rates Advanced.—The Arkansas Valley Interurban Railway, operating from Wichita to Hutchinson and Newton and serving intermediate points in Kansas, has been granted an increase in passenger rates by the Public Service Commission. The new rate, effectiv May 22, calls for 3.6 cents a mile instead of 3 cents. The interurban is now on the same basis in this respect as the steam roads.

Change in Ticket Fare in Danville.—The Danville Traction & Power Company, Danville, Va., has been denied the 8-cent fare which it recently sought. C. G. Holland, president of the company, asked for a franchise amendment to permit the corporation to raise the fare from 7 cents. As a compromise, however, the company is permitted to sell four tokens for 25 cents, instead of five for 30 cents, as at present.

Special Cars for Summer Outings.—The Reading Transit Company, Reading, Pa., has invited its patrons to prepare for their family outings in the summer months by transportation on the street cars. All the parks in Reading and vicinity that are especially popular with picnic parties are now being prepared for the public's use. Special service will be provided for summer picnics and the company urges all to fix the date in advance so as to avoid the likelihood of conflict with outings of other organizations.

Single Fare to Park for Summer.—The City Council of Fort William, Ont., has authorized the charging of a single fare to Chippewa Park for the summer to promote traffic on the park entension line of the Fort William Municipal Railway. An experiment was made with a single fare to the park in August, 1926, but it was not altogether successful, mainly on account of weather conditions. The Trades and Labor Council took the matter up for this year.

Would Sell Land.—The San Francisco, Napa & Calistoga Railway has applied to the California Railroad Commission for authority to sell a small parcel of land in the city of Vallejo, comprising a portion of its right-of-way abandoned for a new location.

Advances in Wages Approved.—Wage increases were approved by the City Council of Edmonton, Alta., for the motormen-conductors of the Edmonton Radial Railway. They became operative as of April 1. The commissioners' report stated that the change involved a 1-cent increase an hour in each case on the present classification up to the fourth six months. It was further urged in the report that an additional class should be added for the fourth year and thereafter at 67 cents an hour, the highest at present paid being 65 cents. The adoption of this additional class would apply to approximately 80 per cent of the motormen at present in the service and amount to an increase of 2 cents an hour to the bulk of the motormen. The effect of the increase granted is to add about $15,000 a year to the wage accounts. The men's request for the fixing of an eight-hour day instead of a nine-hour day as at present was withdrawn.

Will Refund Car Fare.—When cars of the Nashville Railway & Light Company, Nashville, Tenn., stop before the Capitol Theater from May 23 to May 28, M. B. Thomas, manager, will meet the riders at the theater entrance and refund to them their carfare to and from the Capitol, so anxious is the Capitol management that every Nashville person should see Colleen Moore in "Orchids and Ermine." All that is asked of theater patrons is that they clip the coupon on "Read as You Ride," the pamphlet of the railway, and present it for refund when buying theater tickets.

Stars for Car Men.—Four more employees of the Jacksonville Traction Company, Jacksonville, Fla., have been awarded gold stars, representing twelve months of operation without a chargeable accident. An announcement to this effect was made recently by E. Q. Brown, superintendent of transportation. The four men completed their accidentless period in April.

Investigation Invited.—Mayor Frank B. Lovelace of Poughkeepsie, N. Y., recently sent a letter to the management of the Poughkeepsie City & Wappingers Falls Electric Railway notifying it of unpaid paving warrants amounting to $242,883, including interest and penalties. Without these items the debt would be about $190,000. Ralph F. Butts, attorney for the company, stated that the railway business, like other industries, had felt the general increase in costs of labor and materials caused by the war and had not been able to adjust its rates. For this reason it had to seek relief from the Public Service Commission on various occasions with the result that the fare, which had been 5 cents, was finally raised to 10 cents. However, the company finds itself unable to pay the paving bills at once and would like to have a committee of business men tell it what it would do if it were placed in the railway's position. Full financial statements are open for investigation. In conclusion, he said that the company's plight was a community affair.

Company Goes "On the Air."—A quartet of male voices sponsored by the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., was heard on May 13 over station WRC at Washington. Hereafter the quartet will be heard regularly every Friday night at 8:30 o'clock over the same station. The company resorted to the radio in "putting over" the new articulated cars. A radio announcer told all his listeners that it had spent half a million dollars in installing this service in Baltimore, "the first high-speed articulated, all-steel electric express cars on any interurban railroad in America." The announcer also said that the company had recently established a luxurious motor coach line between Washington and Annapolis over the new National Defense Highway. It was then made plain that the railroad was distributing a free booklet to summer cottages and bungalows in colonies near its lines.

Recent Bus Developments

Buffalo & Erie Agreement with Bus Company Ratified

The Public Service Commission on May 20 approved the petition of the Jamestown-Dunkirk Transit Company, Inc., for amendment to its certificate permitting a change in its route in Dunkirk and also approved an agreement entered into on March 1, 1927, between the petitioner and the Buffalo & Erie Railway, ratified by the city of Dunkirk on March 29, 1927.

According to the agreement the railway will not oppose the amendment of the bus line's certificate, provided it will be effective only for the term during which the agreement shall remain in force; that upon the termination of the agreement the bus lines shall automatically revert to their present routes. Other provisions stipulate that the railway shall furnish to the bus line a supply of transfers good for passage on the railway line in Fredonia and Dunkirk, and shall be entitled to receive from the bus line 10 cents for each transfer honored by it; that the railway and the bus line shall maintain the time schedule of buses and railway service agreed upon between them. It is arranged that the parties will establish, as soon as permission can be obtained from the commission, a joint excursion return trip rate between Lily Dale and Buffalo at $2.75 good in either direction, and a like rate between Buffalo and Jamestown of $3.88, good in either direction.

The agreement is to continue in force until terminated by either party giving to the other 90 days notice, except that in case of violation of the agreement either party may terminate upon ten days notice, specifying the ground of such termination.

Nebraska Operators to Appear on Bus Law

The Nebraska Railway Commission has cited all operators of intertown buses to appear June 8 and show cause, if any, why certain rules and regulations set out in the order shall not be adopted. The Legislature passed a law that becomes effective on July 24, giving the commission powers of regulation except as to rates of fare and the issuance of certificates of convenience and necessity. Previously the state regulatory body has acted under its general powers, but has confined its supervision largely to safety regulations and a requirement for liability insurance to passengers and their property.

The commission indicates that it will forbid any changes in schedules or routes in the future until after application, hearing and order. It will also make a similar ruling with reference to abandonment of a route after it has once been established. The commission will present a new form of insurance policy. The present requirement is for a minimum of $5,000 with a total liability for one accident of $10,000 for seven-passenger buses and with a maximum of $50,000 for 40-passenger capacity vehicles. The maximum will be raised, but the commission will insist that rates be so adjusted as not to be excessive.

Joliet Line Would Substitute Taxis for Unprofitable Bus

Permission to reduce its regular all-day motor coach service between Lockport, Ill., and the new Illinois State Penitentiary at Stateville to three or four round trips during morning and evening rush hours, and to establish taxicab service during the middle of the day, when traffic is light, and at regular taxi rates, is asked in a petition filed recently with the Illinois Commerce Commission by the Chicago & Joliet Electric Railway. The hearing was scheduled for May 25 in Joliet, Ill. According to the company's application, the motor coach line was established at the request of prison commissioners to accommodate workers engaged in construction of the new penitentiary. Since the structure was completed early this year, however, the number of workmen has been reduced and operation of the 2½-mile line is being carried on at a loss. The motor coaches connect at Lockport with the company's interurban cars operating on an hourly headway between Chicago and Joliet.

Bridge Tolls for P. R. T. Buses Increased

The Delaware River Bridge toll charged single-deck buses of the Philadelphia Rapid Transit Company, Philadelphia, Pa., was increased from 25 cents to 50 cents per trip and the double-deck bus rate was raised to 75 cents, from the old rate of 40 cents, at a meeting of the Bridge Joint Commission on May 20. Independently operated buses, which have been paying a rate of 40 cents, will be charged 50 cents when the new rates become operative July 1.

Several of the commission members favored increasing the rates to 75 cents for the single-deck buses and $1 for the double-deckers, it was said after the meeting. The new rates were decided upon as a compromise. Bridge Commissioners estimated the new rates would increase the annual bridge revenues by $250,000.

Notice was served on the Penn-Jersey Rapid Transit Company, a P. R. T. subsidiary, which operates the bridge buses, that the rates would be increased upon expiration of the company's agreement on July 1. Independent operators also had been notified a general increase would go into effect. Passenger car rates were not changed.

Bridge officials said the first agreement was for one year only and was adopted merely as a tentative schedule. It was found the rates were out of line with toll charges on bridges in other sections of the country.

Bus Routes Proving Popular in Buffalo

Bus routes recently established by the International Railway in Kenmore and Tonawanda, N. Y., have proved so popular that additional buses had to be bought to meet the demand for service. Riding on the Buffalo city routes has also steadily increased, making the purchase of additional equipment necessary. Early this year the company placed an order for 24 gas-electric buses. The first of this order will be shipped within ten days. Last year 25 buses were bought and completion of this latest order gave the International Railway subsidiary a fleet of 81 buses, most of them of the modern gas-electric type. Five of the latest order will be of the de luxe style, seating 27 passengers and a special design for interurban and chartered service. Nineteen will be of the standard city type seating 33 passengers.

Additional express service, such as is now provided for North Buffalo and Kenmore during morning and evening rush hours, is being considered by the company and President Yungbluth has invited suggestions from riders as to the time when such service will be most helpful.

"Sho-Li-Mo-Co News" Chosen for House Organ Name

As a result of a recent contest among employees, "Sho-Li-Mo-Co News" is the name which has been officially adopted by the Shore Line Motor Coach Company, Gary, Ind., for its monthly employee magazine. The March number, which is the first issue to carry the new name, is the third which has been published by the company. The paper is edited by Don Bell in conventional newspaper style and consists of four pages of three columns each. It is 8½ x 11 in. and attractively illustrated with pictures of various employees and of buses and other properties of the company.

Buses Not to Replace Interurban

The Massachusetts Supreme Court has ordered dismissed the petition of Franklin P. Miller, receiver of the Boston & Worcester Street Railway, South Framingham, Mass., for permission to discontinue railway service on that line and to substitute buses. Judge Braley made this decision after he had been informed that the business of the company had improved considerably since Jan. 1.

Buses Substituted.—The New York & Stamford Railway, Stamford, Conn., has been authorized by the Public Utilities Commission to discontinue the operation of its railway between Atlantic Square, Stamford, and the New York State line. The petition of the company in which it sought to substitute bus service was recently heard and the commission gave its decision May 11. To operate the bus service the County Transportation Company, Inc., has been organized as a subsidiary. The commission granted permission to operate buses between Stamford and Port Chester, N. Y., and sanctioned a zone charge of 10 cents for the two-zone line. On the railway there were three zones with a 7-cent zone rate. The commission denied a petition by the County Transportation Company for a line between Greenwich and the state line.

Ready for Special Parties.—The Worcester Consolidated Street Railway, Worcester, Mass., has announced that it is equipped to take care of special parties in de luxe motor coaches. Employees are requested to act as salesmen in promoting this service for church picnics, beach trips and other social functions.

Bus Service Increased.—In line with its policy of extending transportation facilities to serve where traffic requirements warrant, the Winnipeg Electric Company, Winnipeg, Man., on May 16 instituted bus service on Ellice Avenue. Buses operate on a 7½-minute headway during normal periods of the day with extra service for the rush hours to provide for a five-minute headway.

Plans for Selby-Lake Bus Line.—A 12½-cent fare for local passenger traffic on the Selby-Lake bus line was agreed on by officials of the Twin City Rapid Transit Company and St. Paul Council members and steps have been taken to have the Railroad and Warehouse Commission approve the plan. As a result this line, already largely a local transportation convenience for residents along the route, will be developed for short trips as an auxiliary to the railway. The plan is to establish the token system on the Selby-Lake line, with two tokens at 25 cents. It will be a pay-enter pay-leave arrangement. Adequate service to meet the needs was promised by T. Julian McGill, vice-president and general manager, if the new plan results in increased patronage.

Buses Replace Cars.—The City Council of Moline, Ill., has authorized the Tri-City Railway to abandon railway service on its Stephens Park line and substitute buses. Similar schedules will be maintained.

Scores Bus Line for Infringing on Railway Territory.—The Public Service Commission has issued an order to John Fabia to show cause why the certificate issued to him Oct. 16, 1924, for a bus line from White Plains to Mount Kisco should not be revoked for violation of its terms. The Westchester Street Transportation Company, Inc., operates railway service in White Plains and one of its lines, known as the Silver Lake line, operates from a point in the town of Harrison to White Plains. The Fabia bus route practically parallels the Silver Lake line of the railway. To prevent competition between the bus line and the railway, a clause was inserted in the certificate issued to Mr. Fabia providing that no passengers should be taken on or discharged along the route operated by the railway or within 200 yd. thereof for rides which begin and end within these limits. Affidavits filed with the commission show that Mr. Fabia is taking on and discharging passengers along the Silver Lake line in violation of the terms of his certificate and also that he is not operating a portion of his route in White Plains over the route prescribed in the certificate.

Financial and Corporate

Gary Railways Would Issue $300,000 Equipment Trusts

Approval of the issuance of $300,000 par value of equipment trust certificates dated June 1, 1927, and maturing in ten annual installments beginning June 1, 1928, is asked of the Indiana Public Service Commission in a petition filed May 17 by the Gary Railways, Gary, Ind. Certificates maturing during the period from June 1, 1928, to June 1, 1932, will carry an annual interest rate of 5 per cent while those falling due thereafter will earn 5½ per cent dividends. They are to be sold at a price of not less than 94 per cent of par value.

The proceeds derived from the sale of these securities will be used to finance in part the purchase of a total of 22 double-truck motor cars. Twelve of the cars have already been acquired and are being operated by the railway, while the remaining ten are now in process of manufacture. The equipment designated will be leased to the company by a trustee at a rental sufficient to cover the interest and principle of the certificates, together with taxes.

Plan to Reclaim Part of Washington-Virginia Road

Faced with the possibility of abandonment of service in the near future on the Falls Church-Fairfax division of the Washington-Virginia Railway, sold at auction recently, leading citizens of that territory are making an effort to form a company to take over the line to insure continued service and to preserve the rail facilities as a factor in the future development of nearby Virginia. To this end Thomas R. Keith of Fairfax and M. E. Church of Falls Church have obtained an option until June 1 under which they have the opportunity of acquiring the Falls Church-Fairfax division for $150,000, the amount it brought at auction.

C. R. Hinchman, Philadelphia, from whom the option was obtained, has indicated an unwillingness to continue operation of that part of the system after June 1.

The Mount Vernon division of the railway, which passes through Alexandria, was disposed of as a separate unit at the auction, and Gardner L. Boothe, representative of the present owners, said no definite plans have been made for the future of that line.

The sponsors of this effort to have the people along the line to Fairfax organize it for the benefit of the community is stated in this outline of the plan:

> The purpose of the purchase of this road is to insure continual operation between Washington and Fairfax; not with the expectation of profiting on the operation of the road, but for the benefit of the patrons and those dependent upon it for transportation, and to insure its operation strictly in the interest of the patrons, devoting the income as far as possible, after a reasonable return upon the investment, to the betterment of the transportation facilities. No watered stock, excessive salaries or financing operations will be charged against the road.

$1,081 Surplus in April in Cincinnati

Decreasing loss in the motor coach operation of the Cincinnati Street Railway, Cincinnati, Ohio, was shown in the statement for April. The statement reveals a deficit of $11,066, against $12,643 for March, 1927, and $14,839 for April, 1926. Reduction in the length of one of the poor paying runs and changes in fare zones are the chief causes for this improvement. The deficit in coach operation for April was absorbed in the revenue from street cars, with a resulting surplus of $1,081 on the combined operation.

Operating revenue	$728,847
Operating expense	584,589
Net operating revenue	$194,257
Taxes	62,872
Operating income	$131,384
Non-operating income	1,811
Gross income	$133,196
Interest, sinking fund and return on capital	132,115
Surplus	$1,081
Total in fare control fund March 31, 1927	424,639
Total in fare control fund April 30, 1927	$425,720
Revenue passengers	8,498,892
Transfer passengers	2,651,239
Free passengers	128,041
Total passengers carried	$11,278,172

In submitting his statement to E. D. Gilman, Director of Public Utilities of Cincinnati, President Draper, in mentioning the expenditure for track reconstruction, stated that the amount expended in general account, way and structures, largely made up of track reconstruction, was just a little less than $100,000; that there was charged directly to operating expense in this account more than the month's regular proportion of the cost of replacements and renewals of track as provided for in the program for track rehabilitation.

Receivers Discharged in Kansas City

Francis M. Wilson and Col. Fred W. Fleming have been discharged as receivers of the Kansas City Railways, Kansas City, Mo. The final decree was entered by Judge Kimbrough Stone, who made the original appointment in October, 1920. The two receivers turned over the railway months ago to the Kansas City Public Service Company, but they were continued in office pending the working out of certain details of closing the six-year receivership.

Even the final discharge contains reservation under which Judge Stone

EARNINGS AND EXPENSES OF MONTREAL TRAMWAYS

			1926	
Revenue:				
Passenger earnings			$12,573,383	
Miscellaneous earnings			317,425	
Bus service:				
Gross revenue	$414,049			
Less interest on investment and operating expenses and other charges	405,255			
Net revenue			8,793	
Gross revenue			$12,899,602	
Expenditures:				
Operating expenses and taxes		$6,582,974		
Operating profit (to the company)		55,276		
Maintenance and renewals		2,870,229		
Total operating expenses			$9,508,480	
Net earnings				$3,391,122

Distribution of Net Earnings:		
To the company:		
For return upon capital value:		
6 per cent on $36,286,295	$2,177,177	
*Interest on additional capital expenditures	460,336	
Interest on working capital	3,915	
Total	$2,641,429	
Which together with the operating profit of $55,276 and interest on investment in bus service of $32,916 constitutes the company's revenue from the contract.		
For expense of financing—one-half of 1 per cent of the sum of $36,286,295 is allowed annually to the company to cover the expense incurred in procuring additional capital. This amount is carried direct to "Reserve for Financing."	181,431	
To the city of Montreal:		
Rental for the period twelve months ended Dec. 31, 1926	500,000	
Balance	68,261	
		$3,391,122

*The additional return of 1 per cent per annum provided by the contract payable for a period extending not more than five years beyond the close of the World War was discontinued Sept. 30, 1926.

can rename the two or appoint other receivers in the event litigation makes the existence of duly authorized receivers necessary. There still is pending an appeal by the old second mortgage bondholders from the foreclosure and form of decree. They seek a judgment against the property.

Montreal Does Well

Tramway in Canadian City Earns 16.98 Per Cent on Its Capital Stock—Earnings for Ten Years Compared

In view of the continuing increase in population and the resulting traffic congestion the Montreal Tramways, together with the Montreal Tramways Commission, has continued to study a definite plan which would not only materially relieve the present congestion but would adequately make provision for future conditions. The directors expect in due course to submit to the civic authorities a general plan of improvement, embracing subways and elevated railways, which, together with the other means at the disposal of the company, will provide efficient and rapid transportation consonant with the growth of the city. These statements were made by Julian C. Smith, president of the Montreal Tramways, Montreal, Que., in the annual report submitted at the annual general meeting held on March 29, 1927.

This for the year ended Dec. 31, 1926, reflects further progress. Net income earned on the $4,000,000 of capital stock was equivalent to 16.98 per cent, compared with 8.03 per cent for the half year ended Dec. 31, 1925, and 15.59 per cent for the year ended June 30, 1925. Up to June 30, 1925, the fiscal year of the company ended in the middle of the year, but a change was then made so that the fiscal and calendar years would coincide and in consequence the report preceding the present one was for a period of six months ended Dec. 31, 1925. Passenger revenues were at a new high level, being shown at $12,573,383 compared with $12,145,440 for the previous full year, which was the former record. The bus service shows a net profit of $8,793 after deduction of interest on investment and other charges and operating expenses. This result compares with a net deficit of $498 on the bus service reported in the statement for the second half of 1925.

During the fiscal year the number of buses in operation has been increased from 24 to 55. The report pointed that the bus service is only on trial and that the increased service was given with a view of meeting the wishes of the public and in an endeavor to relieve the traffic congestion.

The proposed reorganization of the employees' mutual benefit association came into effect as of May 1, following a thorough study and discussion of the scheme by the employees. Under this arrangement the employees are now provided with substantial sick and injury benefits and pension and death benefits in keeping with present-day conditions. During the year the agreement with the employees covering their wage schedule was extended upon similar conditions to July 1, 1930.

During the year $1,000,000 of the common stock of the company was issued to the shareholders at a price of $125 per share, shareholders receiving one share of new stock for each four shares held at the close of business on Oct. 15, 1926. There has been paid in on account of this issue $649,718. The balance due became payable on March 31, 1927.

The accompanying report for the year 1926 shows the results obtained from the operations under the contract with the city, and the share of the gross revenue accruing to the company under the provisions of the contract and the disposition of same.

The gross revenue for the year accruing to the Montreal Tramways from

STATEMENT OF OPERATIONS OF THE MONTREAL TRAMWAYS FROM FEB. 10, 1918, TO DEC. 31, 1926

	Feb. 10, 1918, to June 30, 1919	Year Ended June 30 1920	1921	1922	1923	1924	1925	Six Months Ended Dec. 31, 1925	Twelve Months Ended Dec. 31, 1926	Feb. 10, 1918 to Dec. 31, 1926
Gross receipts	$11,572,210	$10,782,470	$11,773,004	$11,712,525	$12,056,355	$12,463,798	$12,476,566	$6,305,491	$12,899,602	$120,042,025
Operating expenses and taxes	$6,640,715	$5,849,911	$6,327,841	$5,769,403	$6,099,993	$6,246,889	$6,323,000	$3,052,441	$6,582,974	$52,893,173
Operating profit	45,927	46,606	47,442	47,959	48,304	48,554	50,684	26,606	55,276	417,363
Maintenance and renewals	2,098,120	2,190,557	2,529,054	2,579,200	2,492,792	2,579,779	2,577,260	1,599,543	2,870,229	21,516,538
Total	$8,784,763	$8,087,076	$8,904,337	$8,396,563	$8,641,090	$8,875,224	$8,950,945	$4,678,590	$9,508,480	-$74,827,072
Balance	$2,787,446	$2,695,394	$2,868,667	$3,315,961	$3,415,264	$3,588,574	$3,525,621	$1,626,900	$3,391,122	$27,214,953
Allowances due company:										
6 per cent on capital value	$3,018,224	$2,177,177	$2,177,177	$2,177,177	$2,177,177	$2,177,177	$2,177,177	$1,088,588	$2,177,177	$19,347,057
Additions to capital	32,919	69,827	118,859	145,683	164,973	175,918	277,667	195,862	460,336	1,642,048
6 per cent on working capital	40,645	23,832	12,490	6,569	2,530	5,351	5,707	1,733	3,915	102,803
Financing expense	251,353	181,431	181,431	181,431	181,431	181,431	181,431	90,715	181,431	1,612,089
Total	$3,343,142	$2,452,269	$2,489,959	$2,510,889	$2,526,113	$2,539,879	$2,641,983	$1,376,900	$2,822,860	$22,703,998
Balance	*$555,695	$243,124	$378,707	$805,072	$889,151	$1,048,695	$883,637	$250,000	$568,261	$4,510,955
Payable when earned:										
City of Monreal rental	$692,694	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$250,000	$500,000	$4,442,694
Contingent reserve fund	115,722	107,824	117,730	117,125	41,597	....	....	....	....	500,000
Total	$808,416	$607,824	$617,730	$617,125	$541,597	$500,000	$500,000	$250,000	$500,000	$4,942,694
Deficit	$1,364,111	$364,700	$239,022	....	....	....	....	....	....	$431,738
Surplus	....	....	....	$187,947	$347,553	$548,695	$383,637	....	$68,261	....

*Deficit.

DISTRIBUTION OF MONTREAL EARNINGS

Revenue:		
Allowances from contract:		
Return upon capital value		$2,641,429
Interest on investment in autobus service		32,916
Operating profit		55,276
Other revenue (outside of contract)		76,103
Total revenue		$2,805,726
Expenditures:		
Interest on bonds and loans	$2,118,060	
Other expenses	8,506	
Total expenses	$2,126,566	
Net income	$679,159	
Less dividend of 2½ per cent for quarter ended:		
March 31, 1926	$100,000	
June 30, 1926	100,000	
Sept. 30, 1926	100,000	
Dec. 31, 1926	100,000	
Total		$400,000
Surplus for the year		$279,159
Add surplus at Dec. 31, 1925		1,014,037
General surplus		$1,293,197

the operations under the contract, together with the miscellaneous revenue from other sources, has been distributed as shown in the accompanying table.

Rate Making Versus Sales Value Defined

United States District Judge Faris, sitting as a member of the United States Circuit Court of Appeals in the Denver railway case, has concluded that the valuation of a public utility for rate-making purposes may be much greater than its actual or market worth.

At the request of the receiver of the Denver Tramway the United States District Court at Denver fixed a rate-making valuation that was in excess of the claims against the company, both secured and unsecured, when the receiver took charge of the property. On that ground a group of creditors undertook to overthrow the reorganization plan by alleging that the company was never insolvent and should not have been placed in receivership. In affirming the District Court of Denver Judge Faris said:

> The rating base value furnishes no proper or legal criterion on which to bottom actual value. The former, according to the Supreme Court, is, as to physical elements, bottomed on present value of lands held, plus present stable cost of constructing the plant, less depreciation for use since construction, plus a fair allowance for going value, for intangible elements and for working capital. The latter, in a case like this, is bottomed on what a willing buyer, under no duress to buy, ought voluntarily to pay when the seller is forced to sell.
>
> The very definitions thus disclose the difference between such value and actual, or fair and reasonable, market value. The specific elements which enter into the actual value of a great railroad property as a going concern are: (a) The value of the use of such property in the operation of its railroad and the net revenue from such case, and (b) the current market value of its stocks and bonds.
>
> Obviously, the reference to the value of the stocks and bonds must be applied, in case of insolvency and reorganization, largely to the stocks and bonds of the new organization, and not to those of the old and insolvent one, because the latter would not reflect any earning value, but only exchange value under the plan of reorganization. But nevertheless these differences of constituent elements illustrate the fairly clear distinction existing between value for rate-making purposes and fair, market or actual value; and we think, show that the former does not necessarily bear any conclusive legal relation to the latter. Certainly this is so as to the matters herein up for judgment; whether it be so in all cases and situations we need not rule. Indeed, to take any other view of it would present a case of contradiction in terms.
>
> Practically speaking and in the light of human motives and experience, exchange or actual value of any commodity, except jewels, works of art, fungibles (articles destroyed by use), and the like, is bottomed on what a property will produce in earnings to the owner. But rate-making value is not and cannot be bottomed on earnings. If it were, or could be, it is plain that the more a railroad charged and earned, the more it would be entitled to charge and earn, and so, as has been said, there would arise an approximation of perpetual motion.

Interest on Chicago Bonds to Be Paid

The bondholders' protective committees of the Chicago City Railway and the Calumet & South Chicago Railway announced on May 20 that the interest due on the first mortgage 5 per cent bonds of both companies will be paid on Aug. 1. The principal of the bonds matured on Feb. 1 with the expiration of the franchise ordinances. A letter sent to bondholders says earnings are ample to pay interest obligations, and urges bondholders who have not yet deposited their bonds to do so at once in order that they may receive their interest promptly.

Readjustment at Grand Rapids Approved

At a special meeting on May 25 stockholders of the Grand Rapids Railway, Grand Rapids, Mich., approved a plan for readjusting the finances of the company in accordance with terms which have been reviewed previously in detail in the ELECTRIC RAILWAY JOURNAL.

Sale of St. Louis Property Postponed

The foreclosure sale of the United Railways, St. Louis, Mo., scheduled for May 25, was postponed at the request of Samuel Mitchell, solicitor for the Mercantile Trust Company, St. Louis, a plaintiff in the case by virtue of being trustee for an issue of bonds. William I. Igoe, special master, has not set the new date for the sale.

The reorganization committee plans to buy in the properties for the St. Louis Public Service Company, which is asking a 30-year service-at-cost franchise from the city.

The hearing on the application of Receiver Rolla Wells of the United Railways for a straight 8-cent fare has been continued by the Missouri Public Service Commission to permit counsel for the city to study transcripts of evidence offered by the company. The city has withheld its cross-examination.

Meanwhile the commission has been asked by Mayor Miller and Stanley Clarke, attorney for the reorganizers, to fix the rate of return the company should be permitted to earn under a service-at-cost franchise. This recommendation probably will be written into the new franchise before it is submitted to the voters of the city for ratification. Mayor Miller favors 6 per cent on a $60,000,000 valuation.

In his evidence in the rate case now under consideration Receiver Wells is asking for an 8 per cent return and has endeavored to build up a reproduction-new valuation of $101,233,616, and a present valuation of $75,454,073 for fixed property other than land. The going concern value of the properties was set at $8,700,000.

Conspectus of Indexes for May, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	May 1927 **7.44**	April 1927 **7.43**	May 1926 **7.36**	Feb. 1927 **7.45**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	May 1927 **144.2**	April 1927 **148.0**	May 1926 **153.1**	Sept. 1920 **247.5**	April 1927 **148.0**
Electric Railway Wages* 1913 = 100	May 1927 **227.4**	April 1927 **226.9**	May 1926 **225.4**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	May 1927 **201.0**	April 1927 **202.6**	May 1926 **202.4**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	May 1927 **206.8**	April 1927 **209.0**	May 1926 **207.3**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	April 1927 **144.2**	Mar. 1927 **145.3**	April 1926 **151.1**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	May 1 1927 **12.44**	Apr. 1 1927 **12.53**	May 1 1926 **12.86**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	April 1927 **153.6**	Mar. 1927 **153.8**	April 1926 **162.4**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	April 1927 **163.7**	Mar. 1927 **164.1**	April 1926 **168.4**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Apr. 30 1927 **3.456**	Mar. 31 1927 **3.553**	Apr 30 1926 **3.868**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	April 1927 **18.55**	Mar. 1927 **19.53**	April 1926 **18.80**	Oct. 1925 **20.67**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	April 1927 **1671** **55.36**	Mar. 1927 **1882** **99.26**	April 1926 **1741** **47.50**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Personal Items

From "Banana Line" to Road of Service

Jamaica Central Railways Now Provides Adequate Facilities for 30,000 Persons Daily Under W. E. Ross

As a trolley the railway from Jamaica to Far Rockaway and from City Line to Belmont Park was long the community's standing joke. Just one year has changed not only the street railway system itself, but the public's mental attitude toward it. The official cognomen of the old line was the Long Island Electric Railway. Now the reorganized, revamped, repaired, reequipped, remanned and remade system is known officially as Jamaica Central Railways, Inc.

OFFICERS PROMINENT FOR ACCOMPLISHMENTS

Like most other similar enterprises, the Jamaica Central Railways, Inc., reflects the hopes and aspirations of the men at its head. It is officered chiefly by men who had made a mark in the world of finance, but whose experience in conducting an almost defunct railway was negligible. The president is H. Pushae Williams, president of the First Mortgage Guarantee Company of Long Island City and former president of the Queensboro Chamber of Commerce. The vice-president is Robert M. Catharine, Jamaica, one of the officers of the Bank of the Manhattan Company. In the treasurer's chair is Park A. Rowley, another prominent Jamaica banker, who is vice-president of the Bank of the Manhattan Company and in charge of all the Queens branches of this huge and important financial institution. H. L. Dayton, secretary, completes the official roster.

As their titles show, all are busy men. They give of their time to the railway only when matters of general policy are to be decided. The every-day affairs of the company they have intrusted to W. E. Ross, who has been general manager since March 15, this year, but was connected with the company previously and brought to the job a wide fund of experience. More about that later, for after all, accomplishments reflect the personalities of men and very often of one man in particular.

Now for these accomplishments. The Long Island Electric Railway became the Jamaica Central Railways, Inc., on April 6, 1926. The new corporation took over the property from a receiver. It consisted principally of the proverbial "two streaks of rust and a right-of-way." The cars were falling apart. The tracks were so badly worn that cars a dozen times a day left the rails. The concern had some ancient carhouses on New York Avenue, in the Cedar Manor section, but the principal building had never been rebuilt after a fire that practically destroyed it. Such machinery as there was for repairing and maintaining the cars and the roadbed was obsolete and of slight use. Several of the cars had been destroyed in the fire at the carhouse and the new owners found themselves the possessors of 25 ancient vehicles of the closed type and two of the open variety. Only the car crews knew when they were supposed to arrive at or leave any given point and the knowledge did not cause them undue anxiety, for usually it was impossible to adhere to any schedule, so dilapidated and untrustworthy were the cars and so unsafe the roadbed.

W. E. Ross

As quickly as possible, the new management placed six large cars in operation on the Far Rockaway line. Then ten one-man cars were added to the service. Two months ago six more closed cars were put in operation. As a result of the additional rolling stock, the headway has been materially shortened and now there is real service on the system's two lines, one between Jamaica and Far Rockaway and the other from Liberty Avenue and 100th Street, Ozone Park, to Belmont Park. That these two lines are vital to the public is revealed by the fact that 30,000 passengers ride upon them each day. This is an increase of more than 60 per cent over the amount of travel a year ago. Naturally the officers, and especially Mr. Ross, are justly proud of the fact that they can handle the increase and that so many persons find it advantageous to travel on the cars.

Twenty-two of the old cars taken over from the receiver have been repainted and put into first-class condition. All the obsolete machinery has been replaced and much new machinery added, so that the company is now able to keep its rolling stock in excellent condition at all times. A storage shed large enough to hold sixteen cars has been erected at Cedar Manor on the site of the one destroyed by fire. Into this shed every car is run at least once each week—every time it has traveled 1,000 miles—to be thoroughly inspected and, if necessary, repaired. Each car gets a daily cleaning and a weekly bath. All in all, 33 cars are in daily operation. Within a month there will be 37 on the daily schedule.

The officers of the company have gone further than merely to rebuild their cars, replace their trackage and wiring and machinery. They have created out of a haphazard nucleus of employees a band of earnest, hard-working men, with a realization that the public interest is their interest. For example, the company, at no cost to its employees, has provided each with a $1,000 insurance policy. To furnish a real incentive to good railroading, there is an annual prize of $500 to the employee with the best record. A bonus is paid monthly to motormen who have had no accidents on their runs. By this bonus system a careful motorman can add $100 to his year's wages. As a result, 52 of the motormen turned in reports for March showing not a mishap.

In all this work Mr. Ross has, of course, been at the front, aided and abetted by the encouragement of the directors of the company and the other officers. He went with the company in April, 1926. Previous to that time he was with the New York & Queens County Railway for nearly fourteen years. His last position with that company was engineer of way and structures under Lincoln C. Andrews. Mr. Ross was educated in the New York schools. The New York & Queens County position was his first job. He is 29 years old, but he has packed a lot of experience into these years. After all, for most of us life is estimated on the basis of accomplishments and not of years. On that basis does Mr. Ross stand revealed as a man of unusual resourcefulness.

◆

Key System Changes

W. R. Alberger and G. H. Harris Withdraw from Oakland Property—A. J. Lundberg a Director

Important changes are announced in the personnel of the Key System Transit Company of Oakland. W. R. Alberger, who has been connected with the company for the last 21 years, resigned as vice-president and George H. Harris resigned as general manager. It is understood Mr. Alberger will remain a member of the board.

Mr. Alberger has been succeeded by Alfred J. Lundberg, member of the San Francisco stock brokerage firm of J. Barth & Company, now the largest holder of Key stock. Until two years ago Mr. Alberger was vice-president and general manager, but was relieved of the duties of the last-named office, being succeeded by Mr. Harris.

The position of general manager, vacated by Mr. Harris, has been abolished, effective on June 1. Lester S. Ready, president of the company, will become operating head. Mr. Harris was promoted to the office of general manager from chief engineer.

In commenting on the changes, President Ready said:

> Following the election of Gustav Epstein and A. J. Lundberg as directors a few weeks ago, A. J. Lundberg has been chosen vice-president of the Key System Transit, succeeding W. R. Alberger, resigned.
>
> This is simply a recognition of the largest holders of Key System securities and brings to the service of the system several men of high standing who have a personal interest in the development of transportation in the East Bay district.
>
> Messrs. Epstein and Lundberg and H. E. Clayburgh, who has been on the board

since last November, are partners in the old established firm of J. Barth & Company, San Francisco, large holders of Key System securities. The partners in this firm intend to give of their time to the East Bay's transportation problem, the solution of which is as important to the people of the East Bay as to the owners of the Key System Transit Company. Both the people and the company are to be congratulated that men of standing will devote their time to reaching such solution.

Mr. Lundberg issued a statement in which he said:

> Transportation is the backbone of every growing community. The Key System Transit Company is in the business of furnishing transportation to ten East Bay municipalities and two East Bay counties. The Key System is, therefore, the backbone of those ten municipalities and portions of these two counties. This is fully realized by my partners and me in taking positions as Key System directors. We believe in the East Bay and its growth and our primary idea will be to furnish adequate transportation of the right kind. Other plans will be secondary.
>
> The Key System occupies the most important position in the East Bay, absolutely dominating local transportation and practically dominating transbay transportation. We do not intend to lose or jeopardize our dominating position. The Key System is fundamentally sound. It has ample physical assets. But there are many things that can be done in a spirit of co-operation between the people we serve and ourselves. We are ready to go much more than half way.
>
> Our policy will be, first, a transportation system that will meet the needs of the wonderfully growing East Bay district. We in San Francisco are beginning to discover what you have in the East Bay. Millions of dollars of San Francisco money are being invested in Oakland and millions more will come if the same spirit of co-operation that has existed in the last few years continues. My partners and I have already invested large sums in Oakland and some of the directors of the Key System have been instrumental in bringing other millions to this side of the bay. I look for a wonderful growth, in which we hope to participate.

Retirement of Mr. Alberger and Mr. Harris means the withdrawal from active management of the East Bay's car lines and transbay ferry service of the last survivors of the F. M. Smith régime.

Further changes are anticipated, it being understood that the two announced are only the start of a thorough reorganization, including a change of policy. It is now declared that the new policy will not include the plans to unify the Key and the Southern Pacific ferry and rapid transit system. These plans had been mapped by engineers of both companies and were being studied by the respective managements.

In Memoriam

JUNE 1, 1926—JUNE 1, 1927

"We Live in Deeds, Not Words"

Since June 1, 1926, Death, The Inescapable, has taken its toll of those in our industry whose deeds live after them. At this season of memorial, the JOURNAL *is calling the roll, conscious that it will be answered by the thoughts of comrades who still march forward, guided by the unquenchable ideals these dead have bequeathed them.*

ELISEUR S. GOODRICH, former president Hartford Street Railway

J. D. SPRECKELS, president San Diego Electric Railway

JOHN E. DUFFY, general superintendent New York State Railways

BERT WEADON, traffic manager Interstate Public Service Company, Indianapolis

WILLIAM S. HAMILTON, supervisor of stores New York State Railways

GEORGE L. FOWLER, consulting engineer

CHARLES A. COFFIN, president General Electric Company

HERBERT C. MOSER, general manager Chicago Motor Coach Company

FRANKLIN S. TERRY, vice-president General Electric Company

JULIUS THIELSON, superintendent Providence & Danielson Street Railway

RUSSELL A. WILSON, assistant general manager Spokane United Railways

P. F. SULLIVAN, Bay State Street Railway

CLIFFORD A. ELLIOTT, cost engineer Pacific Electric Railway

C. R. HUNTLEY, director International Railway and president of the Buffalo General Electric Company

J. E. ALLISON, head of James E. Allison & Company, Consulting Engineers

ROBERT JEMISON, former president Birmingham Railway, Light & Power Company

A. D. MCPHERSON, auditor Pittsburgh Railways

ALFRED CRAVEN, well-known engineer

FRANK COOK, sales manager Ohio Brass Company, St. Louis district

CLERMONT HARVEY WILCOX, president New York Insulated Wire Company

ANDERSON GILBERT MOORE, industrial agent Interstate Public Service Company

SIMON BAMBERGER, chairman of the board Bamberger Electric Railroad

Z. E. KNAPP, director of construction London Underground Electric Railways

E. W. BOWMAN, supervisor of insurance Philadelphia Rapid Transit Company

CHARLES S. BUTTS, engineer in Department of Public Utilities for St. Louis

R. E. BREED, director American Light & Power Company

ADOLPHE ALFRED DION, president Moose Jaw Electric Railway

PAUL E. MERCIER, member Montreal Tramways Commission

FREDERICK M. NELLIS, special representative at New York Westinghouse Air Brake Company

FRANK M. WEBSTER, claim adjuster Grand Rapids Railway

VIRGIL R. POWELL, vice-president and general manager Peoples Railway, Dayton

CHARLES EDWARD WARREN, long connected with New York Railways and Interborough Rapid Transit Company

W. H. LONG, superintendent of power York Railways

HUGH A. HEULINGS, sales representative Brill Company

COL. WILLIAM G. DOWS, president Iowa Railway & Light Company

WILLIAM B. MCKINLEY, former head of Illinois Traction System

HENRY J. ARNOLD, organizer of the Durango Street Railway

FREDERICK G. ORCUTT, assistant paymaster Connecticut Company

E. M. WALKER, president Schenectady Railway

WILLIAM T. FITCH, superintendent maintenance of way Philadelphia Rapid Transit Company

SAMUEL M. CLEMENT, former Public Service Commissioner of Pennsylvania

ALVES DIXON, general manager Baton Rouge Electric Company

C. E. A. CARR, former Canadian electric railway official

M. H. BRONSDON, former chief engineer United Electric Railways, Providence

CLIFTON COLBRUN, treasurer of Nahant & Lynn Street Railway

ANSON W. BURCHARD, vice-chairman of board General Electric Company

COL. H. G. PROUT, internationally known engineer and editor

WILLIAM L. SCHULZ, formerly claim agent Washington, Baltimore & Annapolis Electric Railway

WILLIAM WRIGHT, auditor Washington, Baltimore & Annapolis Electric Railway

WILLIAM H. HODGINS, secretary Okonite Company

O. C. MACY, vice-president Chicago, Harvard & Geneva Lake Railway

ALBERT BATH, executive of Detroit Department of Street Railways

RUSSELL ROBB, senior vice-president Stone & Webster

LYNN SHADDEAU, purchasing agent Saginaw Transit Company

JOHN S. MOORE, general passenger and freight agent of Chicago, South Bend & Northern Indiana Railway

CHARLES SIDNEY BAXTER, formerly with law department Boston Elevated Railway

EDWARD CARPENTER WOOD, president Mica Insulator Company

EDWIN SAMUEL ELY, consulting engineer Virginia Electric & Power Company

DUDLEY FARRAND, vice-president Public Service Corporation of New Jersey

GEORGE J. BALDWIN, Stone & Webster

JAMES W. SAMUEL, former assistant treasurer United Railways, St. Louis

JOE C. THOMPSON, secretary and assistant treasurer Texas Power & Light Company

WALLACE HECKMAN, vice-president Chicago Railways

OREN JOSEPH SMITH, one time chief engineer Denver Tramway

JOSEPH J. HEIM, railway pioneer in Missouri and Kansas

ALBERT BALL, chief mechanical engineer Sullivan Machinery Company

FRED W. REITZ, president Evansville Traction Company

JILSON J. COLEMAN, vice-president and general manager Scranton Railway

MAJOR S. L. NELSON, pioneer utility magnate in the Middle West

ALBERT M. LYNN, president West Penn Electric Company

WILLIAM T. NARY, superintendent Berkshire Street Railway

CHARLES L. HENRY, receiver Indianapolis & Cincinnati Traction Company

W. KESLEY SCHOEPF, former head Cincinnati Traction Company

MARSHALL G. LINN, vice-president and general manager Des Moines Electric Light Company

G. E. MALTBY, vice-president Jamestown Street Railway

CLYDE F. KALP, treasurer West Penn Railways

R. S. MADDOCK, superintendent of equipment United Electric Railways

H. E. HUNTINGTON, father of the Los Angeles local and interurban systems

Henry E. Huntington Dead

Romantic Career of Retired Railroad Director Ends in His Seventy-eighth Year—An Important Figure in California Utility Development—A Book Collector and Art Connoisseur

NOT all poets express themselves in words. This comment might serve as a fitting eulogy on the life of Henry E. Huntington, which terminated on May 23. The romantic and imaginative soul, nephew of Collis P. Huntington, among the first of the country's railroad men, found an outlet for his feelings in organizing and directing railroads, collecting rare books and works of art and in generously donating to philanthropic causes.

Not unlike the poet, the realization of profits alone was not the driving force back of his pioneering. True, he amassed a great fortune both for himself and his backers, but he was always peering beyond the horizon of personal profit, measuring his gain by the usefulness of his ventures. And the beneficiaries of his tireless energy, unfailing courage, unbounding resourcefulness and reliable judgment bear testimony to his transcendental vision. His genius for acquisition, minus the usual concomitant of avariciousness, is evidenced in his library and art collections, which upon his death are turned over to the public in perpetuity. In a beautiful building in San Marino, Cal., young and old, rich and poor, can view the famous Bridgewater library, renowned in England since the days of Queen Elizabeth and bought by Mr. Huntington in 1917. Competent authorities place the value of his art and rare books and manuscripts between $30,000,000 and $40,000,000, but Mr. Huntington did not count the cost. The hope of the man was that within the white stucco structure, finished in Italian style, inspiration could be had for the seeking.

BLAZED THE WESTERN TRAIL

Surely Californians, and especially sons of Los Angeles, are both grateful and proud that Henry E. Huntington had a hand in the making of the West, for at the psychological hour in 1898 when the city of Los Angeles was cautiously courting prosperity along came the needed financier, who with foresight and courage projected a network of electric railways in the city which converted hamlets and villages into commercial and trading centers and made barren ground desired sites for homeseekers. Southern California, Henry E. Huntington and prosperity became a triumvirate the exploits of which will fill many pages of history.

As if by instinct he gradually gravitated to railroading. Though a descendant of railroad builders and a nephew of Collis P. Huntington, a pioneer of transcontinental railroad traffic, Henry E. at first showed little inclination for that calling. He left Oneonta, N. Y., where he was born on Feb. 27, 1850, and entered the hardware business. He was then twenty years old. Some years later he embarked in the lumber business in St. Albans, W. Va. Here, it is said, C. P. Huntington noted the ability of his young nephew and made him superintendent of construction of the Huntington line, then being built from Louisville to New Orleans. And so the career of the former hardware merchant began in earnest. He directed as many railroads as his promoter and backer had built. Some years later the elder Huntington made his protégé his chief aid and general representative in running the Central Pacific and Southern Pacific Railroads. As the years advanced the bond between the two men became closer, and when Collis P. Huntington died, in 1900, he left a large share of his millions to his nephew. That fortune and the one inherited by the uncle's widow were united in 1913 by the marriage of the widow to Henry E. Huntington.

Henry E. Huntington

It was after his uncle's death that the younger man turned to the West Coast, especially to developing projects in southern California. He acquired the Market Street Railway, San Francisco, selling the property in 1898 and buying the Los Angeles Railway. He merged a group of interurban railways into the Pacific Electric Railway, but sold that property to the Southern Pacific. It was in Southern California that he was convinced that he had located the field in which his capital might most profitably be employed. Los Angeles today is a thriving example of his judgment in that respect. The construction of the Pacific Electric Railway contributed greatly to the growth of Pasadena, Glendale, Alhambra, Huntington Beach, Alamitos and other important California centers. He added hundreds of miles of track to the system and spent more than $30,000,000 on improvements. The safety and comfort of the passengers were of no less importance to Mr. Huntington than the growth and development of the system. Meanwhile he interested himself in land developments, traffic problems, power development and all forces which might play an important part in the future of Los Angeles. Few men could read more accurately the signs of the times than Mr. Huntington.

CONTEMPLATIVE IN LATER YEARS

A review of the life of Henry E. Huntington discloses two periods of activity, distinct and defined. It was as if fate somehow had summoned him to fulfill two missions, the first to be concluded at about the age of 55 and the second with his death, at 77. In that first period he exhibited an uncanny capacity for physical activity and accomplishments only to be equaled by his desire for reflection and contemplation in the winter of his career. He was famous in his younger days as a director of railroads and in his older days as a pre-eminent collector of rare manuscripts and a connoisseur of works of art. His genius for acquisition was no less noteworthy, whether the object of his desire was a railroad or a Rubens, and the same characteristics which insured success in his early business ventures and won for him the reputation of pioneer and genius stamped him as a distinguished collector of books and works of art and intrenched him firmly in more than local affections. There is unmistakable evidence of the pride of the public in the certain endowments directly attributable to the railroading and rarity ventures of Henry L. Huntington.

Nicholas F. Niederlander, 80 years old, who was president of the Westinghouse Coupler Company until about fifteen years ago, when he retired, died in St. Louis, Mo., on May 20. He was president of the Westinghouse company for ten years prior to the time he retired.

John H. Slough, for 23 years a general claim agent for the United Railways, St. Louis, Mo., died at his home in Overland, St. Louis County, Mo., on May 13. He retired from active field service four years ago, but since then had been on special assignment in the office of the claim department of the company. He ranked as an assistant claim agent. Mr. Slough was 70 years old.

William E. Holstock, superintendent of transportation on the Syracuse lines of the New York State Railways, died on May 5. He had charge of all employment, discharges and discipline. At a very early age Mr. Holstock took a position with the Saginaw Street Railway, where he received experience in railroading both as a conductor and a driver of horse cars. In 1887 he went to Syracuse and entered the employ of the People's Railroad, where he soon was advanced to the position of carhouse foreman. In this position he had charge of 400 horses housed at the carhouse and his duties included the buying, selling and trading of horses. When the Syracuse lines were electrified Mr. Holstock was made station master at the Wolf Street station. On April 16, 1906, he was appointed general foreman. He next advanced to superintendent. Mr. Holstock was born on June 14, 1859.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Large Coal Stock Nullifies Strike Menace

The Bureau of Mines stock report raises the curtain on the stage which was set April 1. It confirms in full the impression that had been created by heavy production that stocks are enormously large. They are so large that, strike or no strike, they will dominate the market for months to come.

Stocks of bituminous coal in the hands of consumers totaled 75,000,000 tons. This is 12,000,000 tons in excess of the previous record, established on Armistice Day at the close of the fuel administration's campaign for emergency storage. It is 13,000,000 tons greater than the reserve built up at the beginning of 1924, when consumers foresaw the possibility of a strike which was avoided by the Jacksonville agreement. It is from 12,000,000 to 15,000,000 tons greater than the reserve at the beginning of the strike of 1922. Besides the coal in the hands of consumers there was a very large reserve in transit.

The record shows that consumers have refused to take chances, despite the practical certainty that production would continue at the rate of 8,000,000 tons or 9,000,000 tons a week, as against only 3,000,000 tons or 4,000,000 tons in 1922. They laid in a reserve 20 per cent greater than that which they built up in 1922. The railroads alone have 22,800,000 tons of coal on hand.

With this unusual amount of coal above ground it is regarded as a complete explanation as to why the market has been so dull since the suspension began. At least 40,000,000 tons of the surplus will have to be absorbed before the market will be in a usual state of balance as between buyer and seller. Had there been no suspension it is doubtful if current production would have been any larger. A long period of low weekly tonnages appears inevitable.

Under the circumstances the suspension must last a long time before it can change the market and offer any hope of profit to the hard-pressed union operator. On the other hand, an immediate settlement still would leave the industry faced with the problem of absorbing an undigested surplus of 40,000,000 tons.

Track Reconstruction Under Way in Springfield, Mass.

The Springfield Street Railway, Springfield, Mass., has started work on the first lap of its reconstruction program. Trackwork on Sumner Avenue is to be started at once and the work of tearing up the old trackwork is already under way. The entire project between White Street and the X will be completed in about three weeks. This will be followed by relaying the tracks on Belmont Avenue from the X to the East Longmeadow line. Tracks are also to be relayed on State Street from Benton Street to Pine Point. In order to expedite the transportation of passengers Herbert M. Flanders, general manager, plans to use buses to transfer passengers.

Ban Put on Noisy Exhibits at A.E.R.A. Meeting

In connection with the exhibit application blanks recently mailed out by Fred C. J. Dell, director of exhibits of the American Electric Railway Association, attention is being called to the committee's ruling on noisy exhibits. The ruling especially applies to the Esplanade, Section E, and Exhibition Hall, Section B, where the following restriction will obtain:

"Noisy exhibits will not be permitted to operate during convention sessions except in prescribed areas. Under no circumstances will the operation of noisy exhibits be permitted in the proximity of meeting rooms." Exhibitors are asked to co-operate.

Capitalism and Communism at Grips in Geneva

Russian Delegate Rakes Capitalist System and Suggests Transitional Plan of Eleven Steps for Renewal of Trade—Unanimity on Nations' Interdependence

BY EDWARD J. MEHREN
Vice-President McGraw-Hill Publishing Company

GENEVA, May 9.

THE plenary sessions of the International Economic Conference are over for the present and the committees on commerce, industry and agriculture get under way this morning. The closing plenary sessions rivaled in interest the earlier ones, for they included the speeches most eagerly awaited—those by Henry M. Robinson, head of the American delegation; by the Russian delegates Sokolnikoff and Obolenski-Ossinski; by W. T. Layton, editor of the *Economist* and member of the British delegation, and by Monsieur Loucheur of France.

ROBINSON SPEAKS FOR AMERICA

What would be America's view of the various proposals, was the constant query of the first two days, and when it came none could want a clearer statement than Mr. Robinson's. The American believed that the actual level of tariffs are less of a barrier to trade than lack of stabilization of tariffs, abrupt changes in duties, lack of definiteness in classification and terminology. In maturing methods for mitigating those difficulties the conference might help.

The American delegation, he indicated, would not oppose the international cartel idea as such, but would disapprove government participation in them and insist that they must not exploit the consumer. He sketched briefly and clearly the development of the American industrial system and accounted for our present prosperity by improvements made in management practice, by elimination of waste, by lavish use of machinery and full interchange of information on production and trade methods. He indicated that the tendency of management now was to secure needed economies by bettering its practice, eliminating waste and introducing more and better machinery rather than by wage reduction.

Mr. Robinson, I said, was calm and gracious, but while continuing so he showed that there was fighting reserve, if need be. Sir Max Muspratt, Great Britain, had said that there was no discrimination against America in the rubber exportation restriction, since all nations were treated alike. Mr. Robinson remarked that he could not follow the argument when a non-producing country (America) took 75 per cent of the production, while the country which controlled the restrictions consumed only 7 per cent of the supply.

The speech was well received, and comment on it indicated again the opinion in Europe that we are the darling of the Gods. They are trying to grasp our secret, they doubt that the methods are applicable here, but they vaguely realize that in some way they have to grow into an industrial practice approximating ours.

RUSSIA SPEAKS

But if Mr. Robinson received close attention, the interest was intensified when Sokolnikoff arose. Delegates massed solidly around the tribune to catch every word. What would a new social order say to the old? What message did the Union of Soviet Republics have for the capitalistic world?

But there was disappointment. There was only one message for the capitalistic world: "Come and trade with Russia. We welcome foreign capital. The capitalistic and communistic social systems are different, but they can work together."

The remainder of the address was a defence of the communistic order and the painting of a laudatory picture of Russian progress. He admitted that agricultural and industrial production were above pre-war figures, called into question later by Loucheur and mistrusted generally here. There was no favoritism to any group in the community.

Sokolnikoff having failed to reach expectations, rumor soon had it that his colleague, Obolenski-Ossinski, head of the delegation, would fire the hot shot. And he did. He raked the capitalist system fore and aft, accused it of anomalies, of causing the World War, of impotence to handle the economic situation effectively. Even the most ardent apostle of "capitalism rampant" had to admit that some of his criticism caught chinks in the armor of capitalistic states, though he failed to carry conviction that communism's armor was free from flaws, or that the communistic system had handled or could handle the present economic situation more effectively.

As a transitional plan he suggested eleven steps for the re-establishment of trade:

1. Cancellation of war debts.
2. Increase of wages of industrial workers.
3. Introduction of the eight-hour day for all workers, with six hours in mines and "similar industries."
4. Fullest liberty for trade union organizations and complete liberty for strikes.
5. "Real" measures for relief of unemployed.
6. Raising of unemployed relief funds by taxation.
7. Decrease of unproductive expenditure, particularly in armaments.
8. Abolition of all barriers against emigration and immigration.
9. Cancellation of all systems of protectorates and mandates and recognition of rights of all peoples to self-determination.
10. Suspension of all measures of intervention in China.
11. Suspension of all measures of economic boycott against Russia and re-establishment of relations with her so that she can obtain credit needed for her development, the capitalists in turn securing concessions.

Undoubtedly his speech and that of his colleague were so eagerly awaited because it is appreciated here that a Russia opened for full trade would be an important factor in European trade and industrial recovery.

LAYTON'S SEARCHING EFFORT

An outstanding effort was that of Mr. Layton and the audience was quick to respond to his searching analysis and clear and convincing exposition. He pointed out that despite the recovery of European production in 1925 to 104 per cent of pre-war and trade to 94 per cent there were 10,000,000 men out of work. But it was false, he maintained, to strive to return to the pre-war status. A new status, a "new equilibrium," is needed, due to the following new conditions:

1. The great increase in industrialization in all countries—a continuation of tendencies visible before the war but much accelerated by the conflict.
2. The development of the United States into a creditor nation, but under conditions different than that of previous capital exporting nations, for while Great Britain, for example, as an exporter of capital, had had a surplus of imports, buying goods from countries she financed, the United States was taking steps to keep out the products of countries she was helping to develop or restore.
3. Alteration in emigration.
4. Alteration of trading relations, due to settlement of reparations and international indebtedness arising out of the war. Debtors had to develop an export surplus and creditors to accept an import surplus.
5. The large shrinkage in Russian trade.
6. Division of central Europe into small economic and political units. New tariff walls to the length of 11,000 km. have been erected, there has been a large waste of capital through duplication of plant as between these countries and a reduction in volume of trade between the fractions of the old Austro-Hungarian Empire and between them and contiguous countries, making necessary difficult trade divisions and adaptations.

More Than 100%

With the applications for exhibit space at the annual convention of A.E.R.A. only four days in the mails, Fred C. J. Dell, director of exhibits, reports,

1927

52 Applications totaling requests for 27,296 sq.ft. of space

against

1926

25 Applications for 10,363 sq.ft. for the same period.

Let's Go

The splitting up and duplication of plant run counter to the sound tendency toward consolidation and specialization which have brought such prosperity to the world. Small economic units, he remarked, were an anachronism.

He declared that plans to meet the new conditions must be based on these fundamental, but very simple principles:

1. The interdependence of the nations of Europe is so close that their economic prosperity must rise or fall as a whole; no nation in the long run can be prosperous through its neighbors' misfortunes.
2. Material well-being can only be achieved by economic production; permanent prosperity will never be achieved within by industries or by communities which pursue a policy of trying to make profits by restricting production.
3. Europe can keep abreast of industrial progress only if her economic organization permits of specialization, not merely between businesses but between nations. This requires substantial reductions in existing tariffs, so that the tide of international trade may flow in greatly increased volume.

He favored development of an organization for continued collaboration of these economic problems.

UNANIMITY ON NATIONS' INTERDEPENDENCE

The summaries of these addresses of these first four days indicate generally the consensus of opinion of the delegates and foreshadow the conclusions that may reasonably be expected in the ultimate resolutions. Surely the world will not lack now for an understanding of its economic difficulties.

Chief unanimity is found in the thesis of the interdependence of nations, particularly of those in Europe. At the same time nationalism asserts itself, the small nations, for example, demanding that they be not exploited by international combines of the greater nations, and Italy giving notice that if her people cannot emigrate she will have to set up tariffs to develop new industries for keeping her people employed.

Second in order is agreement that tariffs must be stable and that customs, nomenclature and classification must be simplified and standardized. Theoretical statements are common to the effect that tariffs must be lowered, but one detects reservations and hedging. But such reduction would seem a logical tendency after the easier remedies had been applied and had been operative for a number of years.

On the third most important point, the advisability of international industrial combines, selling agreements, etc., covered by the term cartels, there is hardly unanimity. In general they are accepted as a sound and logical international development rising out of international industrial consolidation. But there are reservations of many kinds. The Americans will disapprove if governments are participants in these international combines if they are exploitive. The socialist and Christian labor unions and Loucheur demand some sort of control mechanism to prevent exploitation of workers and consumers, Loucheur's scheme being a bureau of information, observation and publicity. The non-industrial nations fear exploitation by the industrial powers working in concert. Italy fears their effect in the crystallization of industry, due to a lack of competition, and emphasizes the harmfulness of such crystallization to the nations which "have not yet completed their economic industrial growth."

So while agreements may be looked for on removal of trade barriers, action on international cartels is problematical. Another week will tell the tale.

Experts Will Probe Sales Below Cost

The economic effects upon prosperity of taking business below the cost of manufacture will be studied from all angles at the eighth International Cost Conference, which opens in Chicago on June 13.

About 1,000 accounting executives, who gather the data on which industrial and trade operations are based, will attend the conference. The association has 3,200 industrial companies, including the largest in the country, in its membership of more than 4,000. Each of the 30 chapters will send delegates. C. M. Finney, vice-president of the Worthington Pump & Machinery Corporation, is president.

Key System Will Spend $50,000 for Safety Signals

Lester S. Ready, president of the Key System Transit Company, Oakland, Cal., has announced the immediate expenditure of more than $50,000 in the erection of safety signal devices.

Approved by the California Railroad Commission, the safety device being installed by the Key System is the result of research on the part of H. P. Bell, chief engineer of the Key System Transit Company.

The signals are being installed at all the important crossings and the first one was completed April 19 at 40th Street and Telegraph Avenue, Hayward, Cal.

Many Orders for Mack Buses from Electric Railways

Many orders are reported by the International Motor Company, New York, N. Y., from electric railways operating in various parts of the country:

The New England Transportation Company, bus operating subsidiary of the New York, New Haven & Hartford Railroad, has ordered twelve Mack bus chassis, 230-in. wheelbase, four-cylinder motor. Brown Body is building the bodies.

The Iowa Southern Utilities Company, Burlington, Iowa, has purchased four 25-passenger Mack city type buses, 196-in. wheelbase, four-cylinder motor for city service in Burlington.

The Blue Goose Motor Coach Company, Inc., bus operating subsidiary of the East St. Louis & Suburban Railway, East St. Louis, Ill., has purchased three 29-passenger Mack city type buses, 233-in. wheelbase, six-cylinder motor, for suburban operation.

The New York, Westchester & Boston Railway, a traction subsidiary of the New York, New Haven & Hartford Railroad and operating the bus company, County Transportation Company, has ordered twenty more 29-passenger city type Mack buses for operation in Portchester, N. Y. and vicinity. This order is in addition to the five delivered recently.

Six 25-passenger city type Mack buses, 196-in. wheelbase, four-cylinder motor, have been purchased by the Union Transportation Company, bus operating subsidiary of the Oklahoma Union Railway, Tulsa, Okla.

This does not exhaust the list. It is merely typical of some of the outstanding purchases.

Northern Pacific Buys Gasoline Cars

Northern Pacific Railway, Walla Walla, Wash., has ordered three new gasoline-electric cars capable of pulling coaches, according to F. E. Williamson, vice-president in charge of operations. One of the cars will be installed on a run between Seattle and Bellingham and will be a combination coach, while the two others are to carry baggage and mail, pulling passenger coaches as trailers, in North Dakota, also between Staples, Minn., and Oakes, N. D. The new equipment will cost $130,000.

Copper at Lower Prices—Lead Also Down

THE general feeling in the non-ferrous metal market this week is not one of optimism, as silver is the only metal that has given a good account of itself, the price of 57 cents per ounce on May 25 being the highest since April 11, says *Engineering and Mining Journal*. Copper prices have been driven down close to 12½ cents by forced selling; a fair amount of business was secured, but the total was well below average. Lead prices have declined further, but most sellers have found a satisfactory market in other respects. Zinc has refused to break through 6 cents, but cannot be said to be particularly firm. There is little change in tin or the minor metals, though platinum sagged a little further.

The decline below the 15-cent, delivered, level for copper, which began a little over a week ago, gained momentum during the week ended May 25. Some sellers have consistently kept out of the market, but no one seller can be accused of the entire responsibility for the slashing of prices. On Thursday, May 19, there was little doing, but on the next day copper sold all the way from 12⅞ cents, delivered Connecticut, which was the general level early in the morning, down to 12⅝ cents, which was all some anxious sellers could get late in the afternoon. Since then the market has been generally 12⅝ cents in the East, where most of the business has been done. On May 25, however, copper was offered as low as 12½ cents.

Indications are that good buying would appear at 12½ cents, though the recent sharp decline has scared buyers, and has also had a bad effect, so it is said, on brass and wire business.

Little change has occurred in the zinc market this week, both the prices and the volume of sales being about the same as a week ago. Most of the zinc sold has been for May or June shipment and has been booked at 6.05 cents, though as high as 6.10 cents has been paid for a small quantity of July metal that was not sold to a consumer. London has declined each of the last four days, which weakened the market here slightly on Wednesday. Spot carloads of high-grade continue to be offered at 8 cents, delivered.

In the aggregate a fair volume of lead changed hands in the domestic markets during the week ended May 25, although business was unusually dull for one or two sellers. The preponderance of sales were for delivery in the Eastern territory, though much of this was for shipment from St. Louis. The American Smelting & Refining Company reduced its official contract price from 6.65 cents to 6.50 cents on Thursday, May 19, and very little cutting of this price was reported during the week. The price range in the St. Louis market has been wide. The leading interest, until May 25, quoted 6.20 cents, and until the preceding day made sales at that figure. On the other hand 6.125 cents was done on a fair tonnage as early as Friday, May 20. Sales of small tonnages at 6.15 cents and 6.175 cents were also reported; and several sales were made in Chicago at 6.175 cents. The domestic price continues at levels low enough to exclude Mexican ore lead in spite of some decline, especially in futures, in the London market.

Tin prices were slightly higher May 25 than they were a week ago, the improvement of 99 per cent grade being more important. Straits is scarce for prompt delivery, whereas the lower grade metal is available in moderate quantity, which accounts for the unusually wide spread between the two. Buying by consumers has not been important, but speculators and dealers have done a fair amount of trading.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	May 24, 1927
Copper, electrolytic, cents per lb	12.625
Copper wire, cents per lb	15.125
Lead, cents per lb	6.485
Zinc, cents per lb	6 40
Tin, Straits, cents per lb	67.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.10
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.50

Quotations withdrawn because of strike.

Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15-5.20
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.50
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.63

Estimates place the world's visible supply at the end of May at about 1,000 tons above the corresponding figure for April 30, an increase in shipments from Banka being the principal factor in enlarging the supply.

Rolling Stock

East St. Louis Railway Company, St. Louis, Mo., is reported as having ordered, early this month, six new cars. This company placed in service six completely rebuilt cars on May 11.

Street Railway Properties, Phoenix, Ariz., shortly will purchase a number of one-man, pay-as-you-enter cars due to the passage of a $750,000 bond issue by the municipal authorities on April 30, referred to recently in the Electric Railway Journal. According to law 30 days must elapse before the bonds are marketable.

Track and Line

Kansas City Public Service Company, Kansas City, Mo., is about to lay track on Main Street from Third to Ninth Street and on Grand Avenue from 22d to 24th Street. The new work will increase the total amount of trackage laid since the dismissal of the receivership last October to 8 miles.

Saginaw Transit Company, Saginaw, Mich., has embarked on a general program of track rehabilitation. Work at present is centered on South Michigan Avenue. near the Michigan Central crossing. After completing this the crews will tackle the following jobs: East Genesee from Warren Avenue to Hartsuff Street, Court Street, Warren Avenue, Sixth Street and Wadsworth. Aside from the general track repairing, the company is co-operating with the railroads that are crossed in repairing, raising and paving the crossings.

Trade Notes

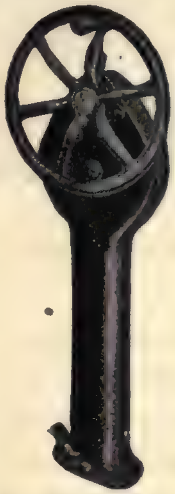
The Dayton Manufacturing Company, Dayton, Ohio, announces the opening of a New York Office at 918 Havemeyer Building, Church Street. This office will be in charge of Joseph Leidenger, vice-president.

The White Company, Cleveland, Ohio, has devoted issue No. 73 of its house organ, the *Albatross*, to a novel presentation of the White cars that bind motor transportation with nationally advertised products. The magazine is profusely illustrated and includes pictures of the trucks of 57 companies that own more than 9,000 White trucks and buses.

New Advertising Literature

The National Machinery Company, Tiffin, Ohio, has placed in the mails "National Forging Machine Talk No. 61."

Ohio Brass Company, Mansfield, Ohio, is mailing out a new valve folder describing its O-B line of standard globe valves.



"PEACOCK"
(Reg. U. S. Pat. Off.)
STAFFLESS BRAKES

Lindbergh Hurtled

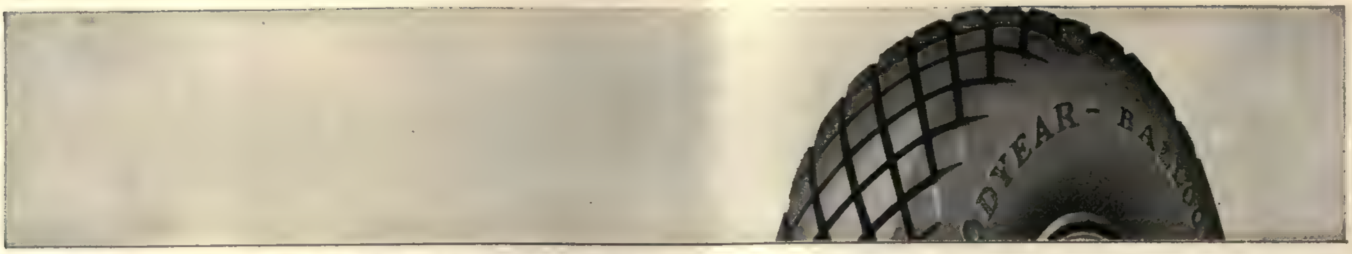
through the air to Paris without a Peacock Staffless Brake — but *his* problem was to *keep going.* If he were making the trip in a trolley car his hand would have reached for the handle of a "Peacock" more than once.

When trolley cars have to stop short the Peacock Staffless Brake is the ultimate and complete agency of safety that makes a hair line margin a mile wide.

National Brake Company, Inc.

890 Ellicott Square **Buffalo, N. Y.**

Canadian Representative:
Lyman Tube & Supply Co., Ltd., Montreal, Can.



What SUPERTWIST Adds to Goodyear Tires

One of the Goodyear-equipped fleet of the California Transit Company, Oakland, California

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus Tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other injuries. It thus insures virtually *double* the *carcass* life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

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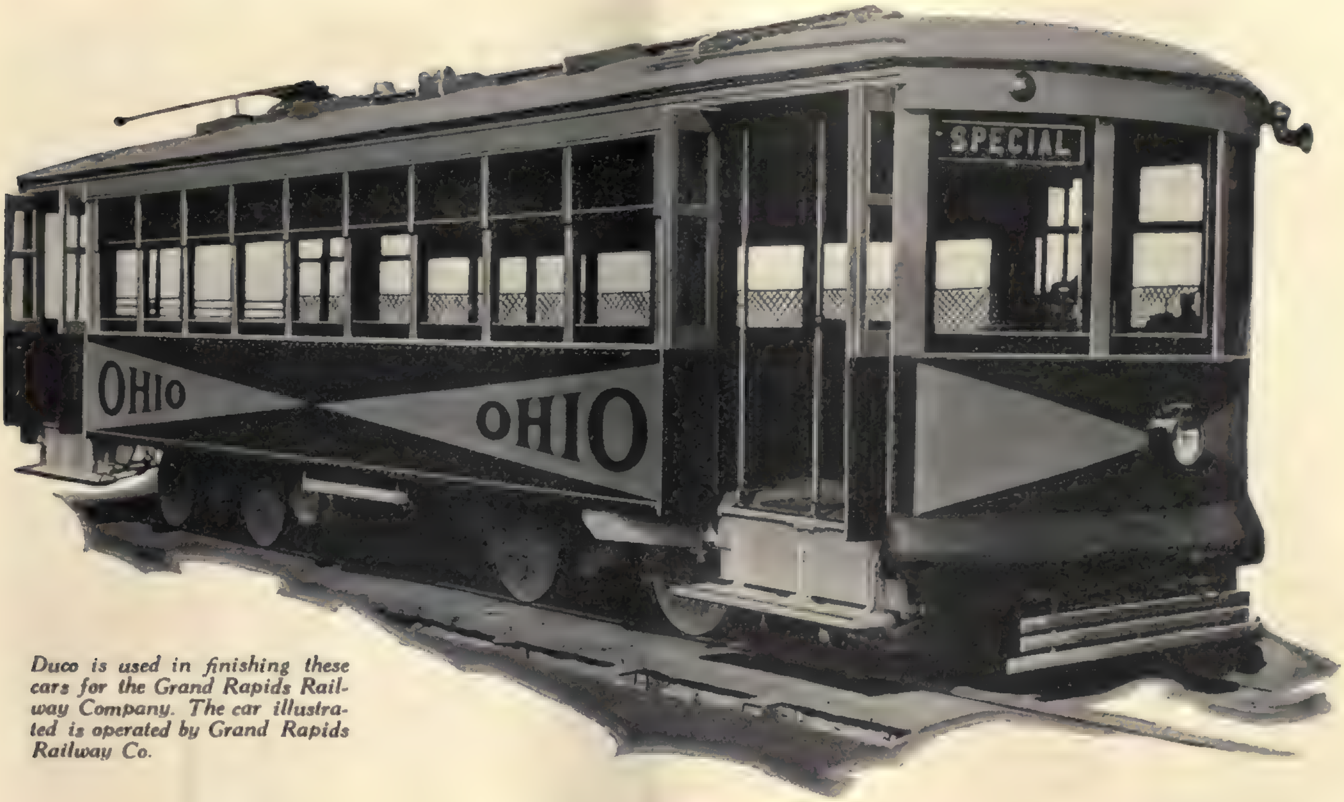

Duco is used in finishing these cars for the Grand Rapids Railway Company. The car illustrated is operated by Grand Rapids Railway Co.

Comfortable Cars Prove Successful . . .

FIRST proof of the feasibility of furnishing comfort as well as utility in street railway transportation is shown in the 1926 report of the Grand Rapids Railway Company, which last June installed on its lines a new and revolutionary type of electric car. The new cars, with streamline bodies, "bucket" seats, rubber flooring, and smoking compartments, were such a departure that they were immediately internationally called the "Grand Rapids type." Operating results show the wisdom of the innovation. During the period June to November, passenger revenue gained 2.51 per cent on these lines and expenses decreased $45,170. In the hard uphill fight to rehabilitate street railway companies the most progressive executives are realizing that among the most important necessities are those of providing attractive, comfortable cars such as the motoring public is accustomed to, decreasing operating expenditures, and maintaining regular, speedy schedules.

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24.09c. *per bus mile !*

—cost of operating Safeway Six Wheelers in St. Louis

	Cents
Superintendence of Plant and Equipment	0.63
Maintenance of Bus Bodies	0.28
Maintenance of Bus Chassis	2.61
Tires and Tubes	2.04
Shop Supplies and Expenses	0.14
Retirement Expenses (25% per year, of cost)	3.68
Fuel for Revenue Vehicles	2.06
Lubricants for Revenue Vehicles	0.21
Garage Supplies and Expenses	0.73
Superintendence of Transportation	0.12
Drivers' Wages	5.16
Other Road and Transportation Expenses	0.22
Traffic Promotion	0.01
Injuries and Damages	0.84
Insurance	0.05
Special Transportation Expense	4.74
Other General Expenses	0.04
Taxes	0.53
Total, cents	24.09

An Official of the United Railways of St. Louis States:

> "During our second full year of operations the average cost per mile of our Safeways was 1.17c. lower than on our other busses and enabled our subsidiary, The Missouri Electric R. R. Co., to earn an operating profit."

Intelligent purchase and operation will obtain these results for your company. Recent improvements in all Safeway Six Wheel Models assure the operator of lowest cost per bus mile and a maximum of passenger satisfaction.

THE SAFEWAY SIX-WHEELER

THE SIX WHEEL COMPANY, 1800 W. LEHIGH AVENUE, PHILADELPHIA, PA.

Manufacturers of De Luxe, City, and Double Deck Type Six-Wheel Coaches

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ENGINEERING research and laboratory work determine what factors are essential to insure utmost efficiency of operation in every installation of Long Products

LONG MANUFACTURING CO.
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LONG PRODUCTS
AUTOMOTIVE CLUTCHES
AND RADIATORS

windows DO MAKE A DIFFERENCE in the *economy* of the bus

Bus for Third Avenue Railway, New York. Pierce-Arrow Chassis, Paterson Body with Edwards Metal Sash.

Bus builders and operators are interested in our catalog. ***Shall we send you a copy?***

THE moderate initial cost of Edwards Metal Sash—

Together with its surprisingly few calls for repair or replacement—

Make Edwards Metal Sash a distinct economy in bus body construction.

So there is no obstacle to prevent bus operators giving their passengers the comfort of easy-to-open, airtight and silent windows.

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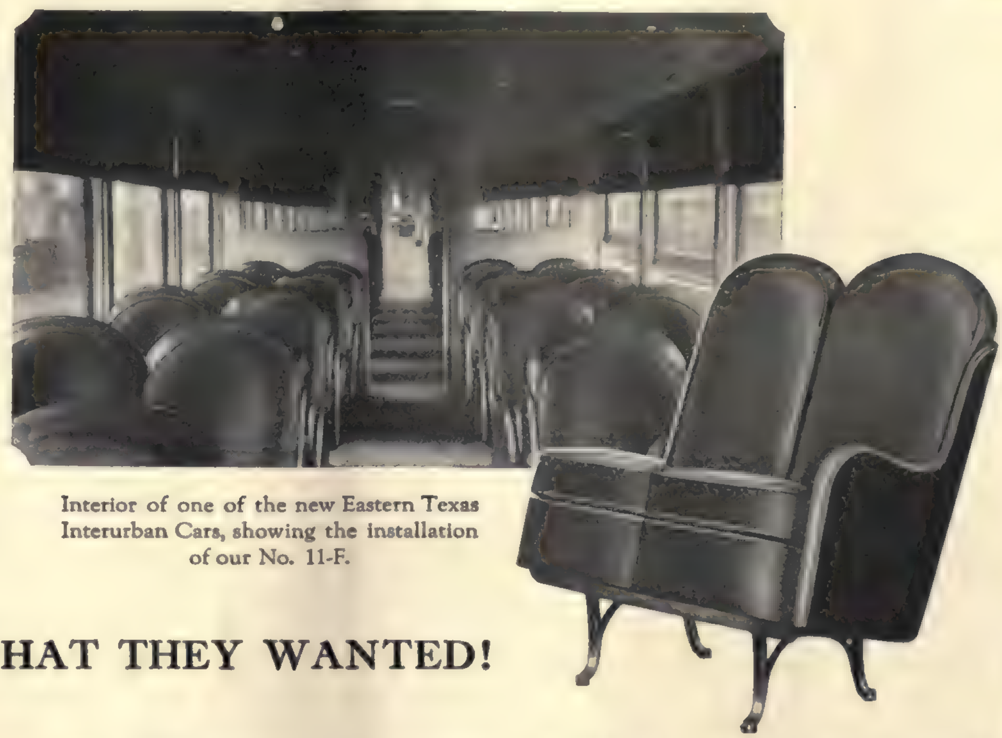
101 YEARS OF MANUFACTURING EXPERIENCE

Cane Webbing may be ordered through any H-W sales office.



Interior of one of the new Eastern Texas Interurban Cars, showing the installation of our No. 11-F.

JUST WHAT THEY WANTED!

THE Eastern Texas Interurban Company was looking for an unusual seat—one that would afford more seating capacity and comfort in a minimum amount of space.

They found just such a seat in the new Heywood-Wakefield 11-F (shown above). This new unit, adapted to interurban and long-distance use, actually affords greater comfort and seating capacity in the shortest over-all length of any seat now on the market. The padded backs are pitched at a restful angle. The deep, roomy seats have comfy spring cushions over our specially built-up construction and the underframe of the seat is of durable pressed steel.

We shall be glad to send you complete information on this practical seat, as well as a copy of our new Bus Seat Catalogue.

Heywood-Wakefield

REG. U.S. PAT. OFF.

Heywood-Wakefield Co., Wakefield, Mass.; 516 West 34th St., New York, N. Y.; 439 Railway Exchange Bldg., Chicago, Ill. H. G. Cook, Hobart Bldg., San Francisco, Cal. The G. F. Cotter Supply Co., Houston, Texas. F. N. Grigg, 630 Louisiana Ave., Washington, D. C. The Railway & Power Engineering Corp., 133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada.

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BALANCED DESIGN—the Cincinnati Principle of modern car building—has been applied just as thoroughly to the development of modern trucks as to the creation of distinctive, attractive and serviceable car designs.

A step ahead of the modern trend

New TRUCKS—

A reason for no small part of the success which has attended Cincinnati NEW Cars

Every installation of Cincinnati New Cars made to date has been successful.

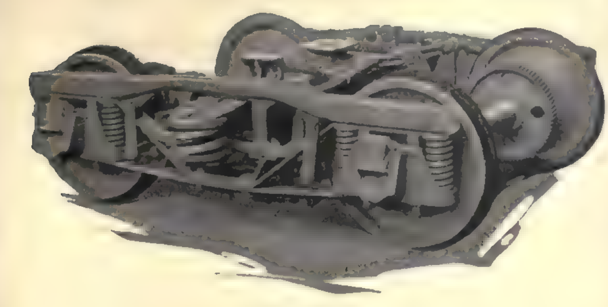
Passengers have commented upon their smoothness in operation. Electric railway companies have praised their rapid acceleration and deceleration. Electric railway records bear witness to their economy in maintenance.

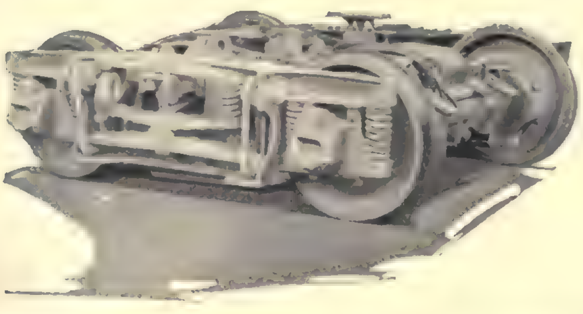
And no small part of the credit is due to Cincinnati NEW Trucks. Here indeed are truck designs embodying features of the most advanced engineering yet attempted in this field. Drastic insulation against road shock, vibration and noise. Radical re-designing of frames and suspension. A liberal use of alloy steels in construction and in bushings for all wearing parts. And the first practical application of the Duplex Air-Magnetic Brake, assuring smooth, positive, rapid deceleration, irrespective of whether track is wet or dry, greasy or leaf-covered.

Features such as these, resulting in more attractive, more economical and SAFER service, warrant your most careful consideration before placing contracts for new cars or new truck units. We will be glad to submit full details and blue prints to any interested electric railway executive.

CINCINNATI CAR COMPANY, Cincinnati, Ohio

CINCINNATI
New
CARS





Why not call them up *Long Distance* order more

A MADISON, WISCONSIN, clothier found that he was having a run on a special suit of collegiate type. He called the Chicago manufacturer on Thursday morning. Eight suits arrived on Friday. The entire lot was disposed of Saturday. "Had it not been for the telephone," he writes, "we would not have been able to satisfy the demand for a week-end business so profitable to us."

FROM ALL PARTS of the country comes similar news. From Wheeling, West Virginia: "A tremendous demand for slickers caused us to save many sales that would have been lost, had we not used the long distance telephone to secure immediate shipments." Louisville, Kentucky: "We use Long Distance for making purchases . . . for hurrying along information and shipments. . . . In many cases it has saved us trips to market." Rochelle, Illinois: ". . . not a week goes by but we use Long Distance to take care of rush orders. . . . The only satisfactory way." Cincinnati: "Long Distance in our case is just as important as the local telephone."

There's scarcely a business in this country that could not use long distance calls to cut costs, save trips and get needed goods. They'll nearly always cost less than you think. . . . *Number, please?*

BELL LONG DISTANCE SERVICE

So that we shall keep faith with the public ~ ~

Out of the gloom of disheartening difficulties has dawned a new era in electric railway transportation. Never in the annals of its history have brighter prospects for its future been recorded.

Basic in its service to the public, faithful in its adherence to principle of low cost transportation, the modern light-weight car was destined to come.

But like all revolutionary developments, the industry required the urge of desperate need to adopt it. The good will of the riding population, the cost sheets of the operators, and the continued faith of the investing public—all demand improved equipment.

St. Louis Car Co

Quality Cars

Obsolete cars stamp a property as "behind the times". They are a badge of failure and a physical handicap to efficient operation. They must be scrapped. Self preservation and common-sense economics demand that the industry keep faith with the public.

There is nothing fundamentally unsound about electric railway transportation. Statistics belie the impression that electric railways are "on the way out."

But modernization is needed to repopularize them in the public mind.

What others have done, you, too, can accomplish. And with the assistance of Quality Shops, you can profit by keeping faith with those whose support is more vital to you than the entire physical value of your property

St. Louis Car Co.

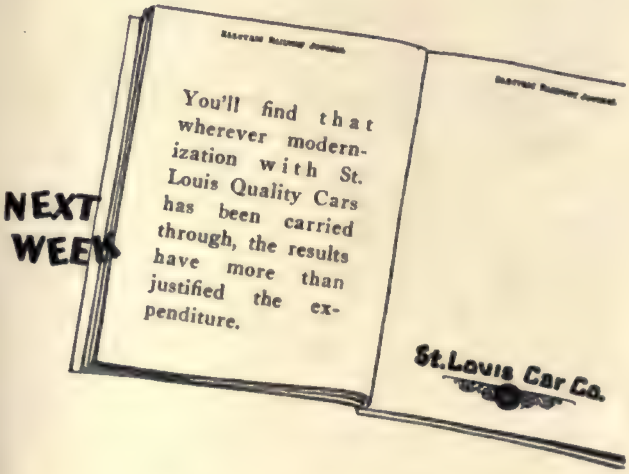
Quality Cars

TODAY

This is neither time nor place to fool ourselves. Just because the electric car is the backbone of the street railway, can we as transportation men ignore its progressive improvement?

You as operators and we as car builders have a real job to do together — to sell a service through a product which will attract patrons, build profits and invite capital.

The "Quality Shops" is committed to this job. *Are you?*



You'll find that wherever modernization with St. Louis Quality Cars has been carried through, the results have more than justified the expenditure.

St. Louis Car Co.

St. Louis Car Co.

Quality Cars

Never in history such congestion—never such peak periods—never such need for absolutely dependable electric railway equipment.

Gary Wheels are not only made of *wrought steel* but they are produced under such precise manufacturing standards that all the service it is possible to put into a wheel is put into them!

Our wheel engineers are wheel specialists—always at your command.

State Street at Madison, Chicago
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Illinois Steel Company
General Offices: 208 South La Salle Street
Chicago, Illinois

17% Reduction in Maintenance Costs with "Thomas Built" Cars!

—Reads the report of the Helena Light & Railway Company, Helena, Montana.

Placed in operation in 1923, three Perley Thomas Cars have met every expectation in their four years of operation. They have greatly decreased maintenance costs, have met with favor by the riding public, have increased patronage and have created friendlier and better public relations. All of which has naturally been favorably reflected in increased net!

"Thomas Built" cars are going far and wide in ever increasing numbers. Why do distant traction companies buy "Thomas Built" cars? Because they are built with the individual care and attention to details which insures a perfect finish throughout and a long life of satisfactory service.

Perley A. Thomas' prices and quick deliveries have established a reputation in the electric railway field. May we quote on your new cars?

Here are the figures:

Placed in service in early 1923, three new "Thomas Built" Cars have shown the following reduction in maintenance costs during the four years they have been in operation: (Note: these figures are lumped with those of a fourth, much heavier car, which, naturally, keeps the figures higher than would be the case were they all "Thomas Built".)

1923	$.0350
1924	.0323
1925	.0308
1926	.0291

In his report on these savings in maintenance costs, Mr. A. T. Schultz, Receiver of the Company, states that these savings are due to the new "Thomas Built" cars.

PERLEY A. THOMAS CAR WORKS
HIGH POINT, N. C.

At Dayton,

View of a section of the tracks operated by the City Railway Company, Dayton, Ohio. Carey Elastite System of Track Insulation forms a water-tight, resilient cushion between the rails and the pavement.

Ohio, too:

this remarkable traction improvement is adding years to tracks and paving

THE City Railway Company, Dayton, Ohio, takes every precaution to provide for the impact of heavily-loaded cars on steel rails. That's why they use Carey Elastite System of Track Insulation.

The City Railway Company has tested this improved development under every conceivable condition — subjected it to the most gruelling tests. And they've stamped it with their approval—endorsed it with repeat orders, time after time.

For they've found that Carey Elastite System of Track Insulation adds infinitely to the life of tracks and paving. It decreases noise; it cuts vibration; it reduces corrugation; it absorbs dangerous stresses between rails and paving. And it reduces maintenance costs to a minimum. Have us tell you more about this interesting development — why it is endorsed by leading traction engineers in cities all over the country. Write today for particulars.

Carey Elastite System of Track Insulation is a preformed asphaltic compound, reenforced with asphalt-saturated fibres. It forms a moisture-proof, resilient cushion between the rail and the pavement. The slabs are made to fit any rail section—and can be installed regardless of weather conditions.

THE PHILIP CAREY CO., *Lockland*, CINCINNATI, OHIO

Carey REG. U.S. PAT. OFF.
Elastite TRADE MARK REGD. U.S. PATENT OFFICE
SYSTEM OF
TRACK INSULATION

American Steel and Wire Company

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Reliable Performance with Simplicity of Application

Here are two of the best all 'round welded bonds on the market. The terminals are designed to fit the rail joints and are easy to apply. The simplicity of application with our alloy flux wire combined with the ease with which the oxy-acetylene flame can be manipulated insures efficient and lasting attachment of these Flameweld Bonds.

Our engineers are ready at all times to assist you. Samples and literature gladly furnished on request.

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DALLAS . . . Praetorian Bldg.
DENVER . First National Bank Bldg.
SALT LAKE CITY. Walker Bk. Bldg.

UNITED STATES STEEL PRODUCTS COMPANY, San Francisco, Los Angeles, Portland, Seattle

Model M

Medium Size Hall-Scott Power

a.c.f.
Hall-Scott

In an 18–23 Passenger Coach

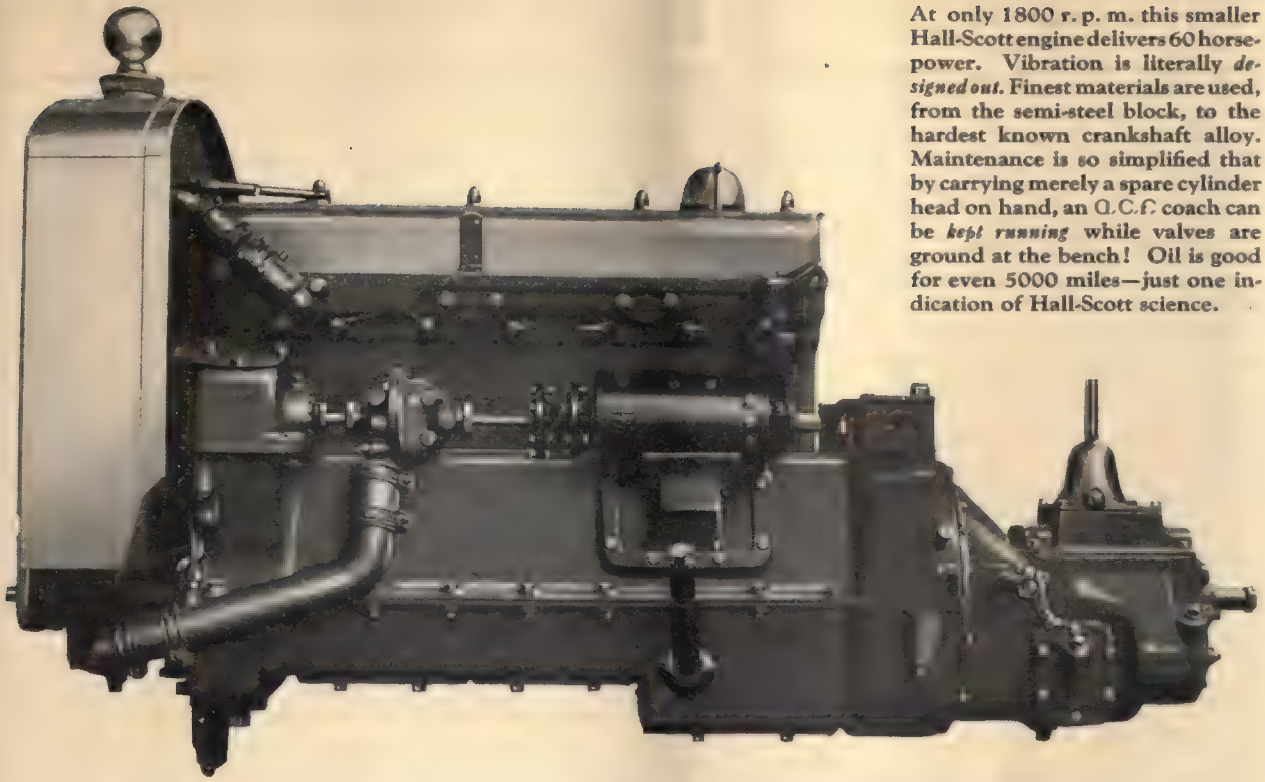
— A. C. F. responsibility and universal transportation experience

— surety, economy and *brilliant action* of Hall-Scott Power

— design that permits scientific, standardized maintenance

— inherent A. C. F. public appeal

The A.C.F. Model M coach not only *looks* low-slung; it *is* low-slung. Hence its surefootedness on any route, its swayless comfort and adequate headroom. The very appearance suggests safety, refinement, power, visibility. The attractiveness of Model M brings business. The performance holds it.



At only 1800 r. p. m. this smaller Hall-Scott engine delivers 60 horsepower. Vibration is literally *designed out.* Finest materials are used, from the semi-steel block, to the hardest known crankshaft alloy. Maintenance is so simplified that by carrying merely a spare cylinder head on hand, an A.C.F coach can be *kept running* while valves are ground at the bench! Oil is good for even 5000 miles—just one indication of Hall-Scott science.

NO OTHER six-cylinder power plant for buses has had the years of development and miles of proof which vouch for the Hall-Scott engine. Six-cylinder Hall-Scott power in a coach of medium passenger capacity assures the greatest economy, endurance and reliability ever available in this type of equipment.

It is another triumph for A.C.F engineering and production resources. A.C.F achievements are winning millions of dollars' worth of orders *and repeat orders*, placed by the most experienced and most critical operators.

The low-speed, uniform high-torque output of A.C.F Hall-Scott engines assures longest life, brilliant performance and low-cost mileage. Scientifically proportioned overstrength in frames and throughout the drive means permanently smooth, quiet, attentionless operation. Simplicity and economy of maintenance show how every unit and detail has been specifically developed for profitable coach transportation under any extremes of operation. And the appearance and riding comfort of A.C.F coaches always assure highest ability to attract and hold volume traffic.

From the A.C.F sales plan involving direct responsibility, right down to the complete provisions for driver efficiency, every phase of A.C.F ownership carries greater assurance of economy, satisfaction and cumulative good will.

AMERICAN CAR AND FOUNDRY MOTORS COMPANY

30 Church Street, New York

A.C.F Model M Coach Specifications

CHASSIS DIMENSIONS—Wheelbase 198″, tread front and rear 65¼″, turning radius 33 feet.

ENGINE—Hall-Scott six-cylinder 3¾″ bore, 5″ stroke, developing 60 brake horse-power. Removable cylinder head, contains complete cam, valve, and governor mechanism; cylinder block cast separately from crankcase. Four main bearings each 3¾″ in diameter. Engine governed at 1800 R. P. M. Electrical system, 12-volt, with 300 watt generator and large size starting motor. Electrical units built by Delco.

CLUTCH—Multiple dry disc type.

TRANSMISSION—4 forward speeds and reverse.

FRAME—Pressed heat-treated steel, maximum depth 9″. 4 tubular cross members and 1 of pressed steel.

SPRINGS—Front 3½″ x 46″, rear 4″ x 60″.

AXLES—Special A. C. F axles, Timken design. Front axle has thrust bearings in steering spindles. Rear axle full floating, inverted worm type.

BRAKES—4-wheel, latest Bendix 3-shoe type.

STEERING GEAR—Ross cam and lever, 20″ wheel.

WHEELS AND TIRES—Budd wheels with 34″ x 7½″ Balloon type tires, single front, dual rear.

STREET CAR TYPE BODY

CAPACITY—23 passengers and driver.

DIMENSIONS—Floor height 23″, step height 16″. Head room in aisle, minimum 76″.

SEATS—Brill type with spring upholstered seats and backs, all covered with genuine leather.

FINISH—Exterior, Pyroxalin enamel; interior, water-proof enamel on ceiling, interior woodwork hardwood in natural color with varnish finish. All hardware nickel plated.

FLOOR—Heavy battleship linoleum.

EQUIPMENT AND ACCESSORIES—Automatic windshield cleaner, rear vision mirror, ventilators, shunt type heater, emergency door, complete buzzer system, six 21-c. p. lamps, ceiling grab rails, grab handles on seat corners, destination signs and all instruments.

PARLOR CAR BODY

CAPACITY—21 passengers in individual seats, all facing forward. (This coach can also be supplied with 84″ overall width body seating 16 passengers.)

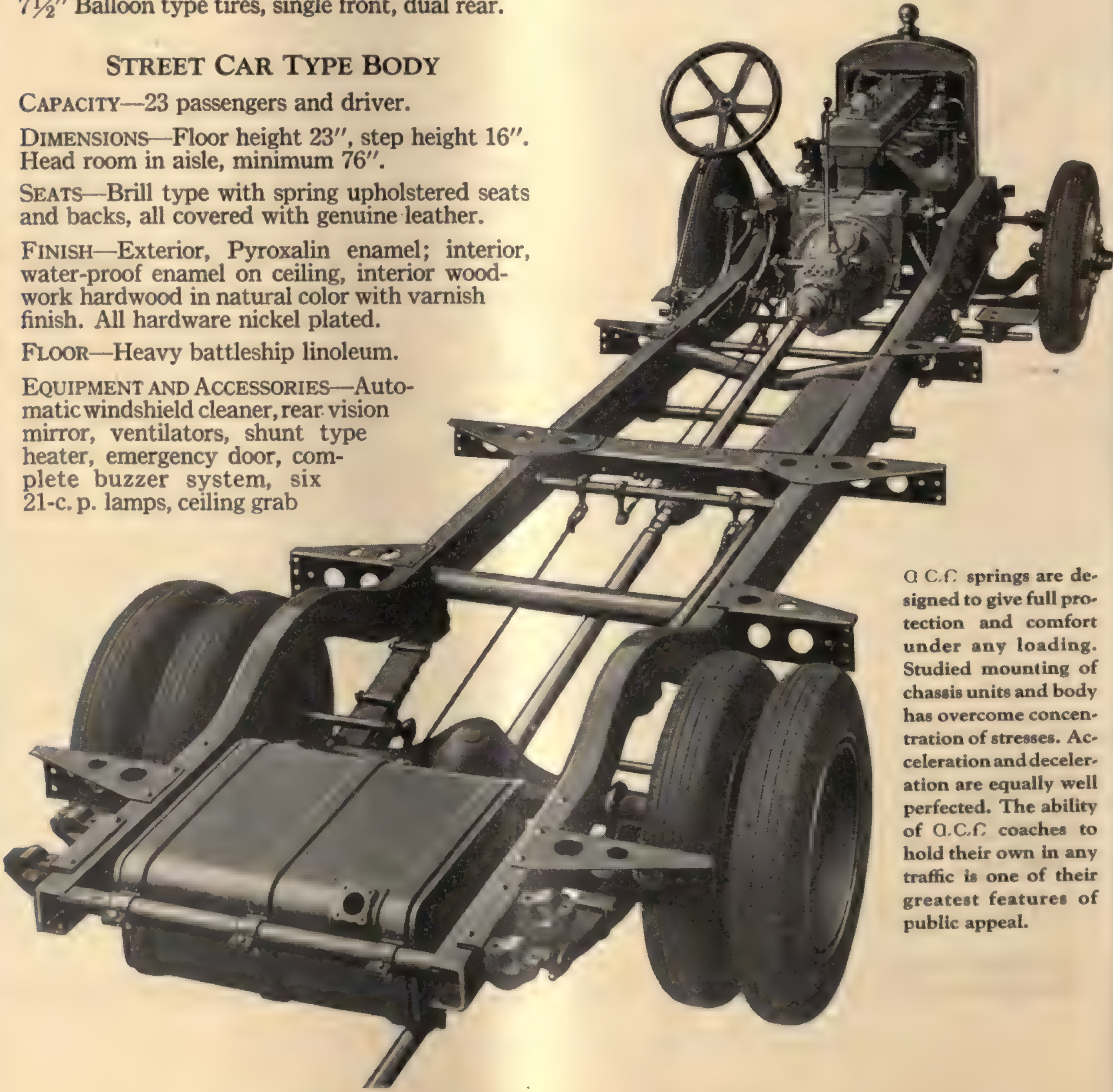
DIMENSIONS—Floor height, 23″, headroom, minimum 65⅜″. Overall width, 21 passenger coach, 90″. 16-passenger coach, 84″.

SEATS—Individually upholstered wicker seats in pairs, finished in genuine hand rubbed leather. Double spring decks in cushions.

FINISH—Interior body lining all water-proof and washable; ceiling, fabrikoid; floor, heavy battleship linoleum; woodwork, mahogany with hand rubbed varnish finish. All hardware nickel plated.

WINDOWS—Wide plate glass windows lowering into body. Sunfast curtains.

EQUIPMENT AND ACCESSORIES—Automatic windshield cleaner, rear vision mirror, bumpers, baggage rack, heating system, ventilators, destination signs, emergency door, six 21-c. p. interior lamps and all necessary instruments.



A.C.F springs are designed to give full protection and comfort under any loading. Studied mounting of chassis units and body has overcome concentration of stresses. Acceleration and deceleration are equally well perfected. The ability of A.C.F coaches to hold their own in any traffic is one of their greatest features of public appeal.

STOP
Chasing Phantoms

DON'T Look for Lost Profits in the Books When the Answer can be Found on the Front of the Chassis.

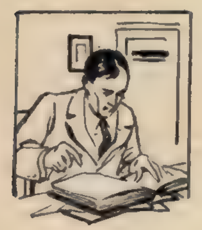
Too high maintenance cost and delays and lay-ups due to breakage are what steal the profits that any truck or bus operator has every right to expect.

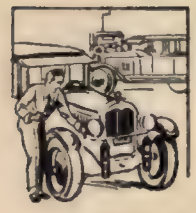
Air springs eliminate these profit stealers because they absorb the road shocks and vibration that cause them.

Records from thousands of truck and bus operators throughout America and Europe definitely prove that this is so.

The initial expense of air springs is small and this is soon wiped out altogether by the savings they effect. Then for month after month they pay dividends on the total investment of the trucks and buses. The chase of the phantom is over.

THE CLEVELAND
PNEUMATIC TOOL
COMPANY
Cleveland, Ohio





GRŪSS
Sleeve Type
AIR SPRING

WESTINGHOUSE
Piston Type
AIR SPRING

THE SHOCK ELIMINATORS FOR TRUCKS-BUSSES-PASSENGER CARS

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

Barron G. Collier
INCORPORATED
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JOHN N. WILLYS

"Behind the Salesman's Call"

JOHN WILLYS—outstanding American manufacturer and merchandizer—says: "The commodity must be at least two-thirds sold before the salesman closes the purchase."

* * * * *

This publication is a part of that essential selling job that means the ultimate order.

* * * * *

Behind the salesman's call is a great chain of information. Changes in practice, new ideas, new policies of manufacturing and marketing—all these reach your eye as a reader and buyer through the editorial pages.

And just as the editorial pages point out new methods and new opportunities of cost-saving or profit-making so the advertising pages reinforce the editorial content with their specific information on products, commodities or services that will put their new ideas to work in your business.

When you reread this issue think of it not as pages of printed paper but as an inventory of information and products and service to help its readers—its editorial material selected from the best of the present, its advertising pages, the paid announcements and descriptions of the output of businesses made to serve you as yours is run to serve others.

ABP

The A. B. P. is a non-profit organization whose members have pledged themselves to a working code of practice in which the interests of the men of American industry, trade and professions are placed first—a code demanding unbiased editorial pages, classified and verified paid subscribers, and honest advertising of dependable products.

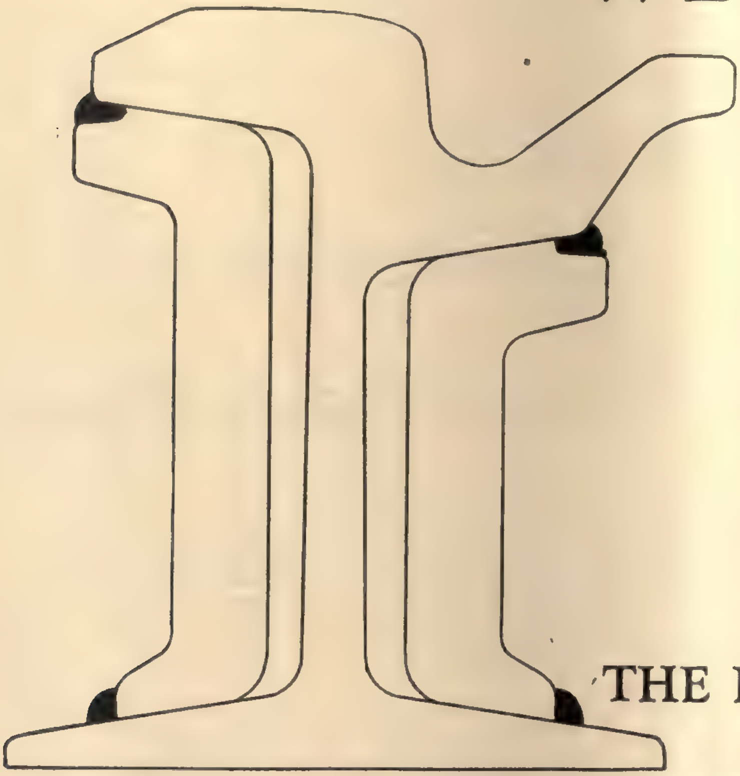
This publication is a member of

THE ASSOCIATED BUSINESS PAPERS, INC.

"WELD PLATES"

For EFFICIENT, ECONOMICAL

JOINTS



Do you believe in statistics? Rely on performance records? If so the performance records of the many "Weld Plates" now in use will convince you that they lead the bar-weld joints in efficiency and economy.

"Weld Plates" represent the most modern welding practice. They are the strongest and most up-to-date plates rolled especially for electric welded joints. Note the shape—the grooves for retaining plenty of weld metal along the upper edges—the wide contact areas at top and bottom—the suitability for the use of short bolts.

A trial will convince you of their efficiency and economy.

THE RAIL JOINT COMPANY

165 Broadway, New York

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Steel Axles Steel Springs

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Gentlemen:—Please send me the **Croft Library of Practical Electricty** (shipping charges prepaid) for 10 days' free examination. If satisfactory, I will sent $1.50 in ten days and $2.00 a month until the special price of $19.50 has been paid. If not wanted I will write you for return shipping instructions.

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EK THOO TEEN

The Cambodians grade their wives Ek, Thoo, Teen, meaning First, Second and Third degree.

The Third degree wife is merely bought.

And that fits patly with the thought so frequently expressed in this column, to wit:

When you get out of the Morganite class in brushes, you simply *buy*—whereas Morganites are the result of careful selection by engineers to fit conditions.

They're first class brushes.

Morganite
Brush Co., Inc.

Main Office and Factory
3302-3320 Anable Ave., Long Island City, N. Y.

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since 1898 and of Chain Grate
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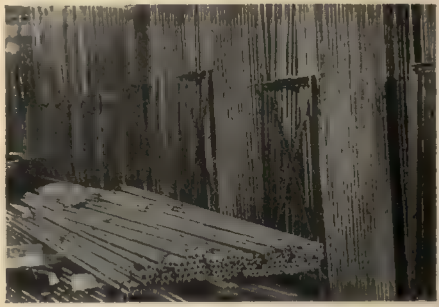

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PRESENT superintendent of railway property operating 30 cars and 10 buses, desires change. Practical experience in each of its departments. Best of references. Correspondence solicited. PW-4, Electric Railway Journal, Tenth Ave. at 36th St., New York.

TRANSPORTATION superintendent, at present engaged in the East, desires to locate in Middle West; 23 years' experience. Age 44. References. PW-1, Electric Railway Journal, Tenth Ave. at 36th St., New York.

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Nearly new with GE-264 Motors, CP-27 Air Compressors, K-63 Controllers, H B Life Guards. Weight 16,000 lbs. $1400 each.

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1—Used, standard gauge, and in good condition.

W-8, Electric Railway Journal
Guardian Bldg., Cleveland, Ohio

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Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

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Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Air Springs
Cleveland Pneumatic Tool Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Automatic Regulator, Voltage, Current & Synchronizing
American Brown Boveri Elec. Corp.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
St. Louis Car Co.
Standard Steel Works
Westinghouse E. & M. Co.

Axles (Front & Rear) Motor Truck & Passenger Car
Timken Detroit Axle Co.

Axles, Steel
Carnegie Steel Co

Axles, Trailer & Motor Bus
Timken Detroit Axle Co.

Babbitting Devices
Columbia Machine Works & M. I. Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Bankers and Engineers
Public Service Engineering Bureau

Batteries, Dry
Nichols-Lintern Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

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Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

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Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Brill Co., The J. G
St. Louis Car Co.

Body Material, Haskelite and Plymetl
Haskelite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co

Bonds, Rail
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

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McGraw-Hill Book Co.

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Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

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American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.

Brake Testers
National Ry. Appliance Co.

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Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
National Brake Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Brakes, Magnetic Rail
Cincinnati Car Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
LeCarbone Co.
Morganite Brush Co.
Westinghouse E. & M. Co.

Brushes, Graphite
Morganite Brush Co.

Brushholders
Columbia Machine Works

Bulkheads
Haskelite Mfg. Corp.

Buses
Six Wheel Co.
Studebaker Corp. of America.

Bus Lighting
National Ry. Appliance Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
St. Louis Car Co.

Cables (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

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Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.

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American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Thomas Car Works, Perley A.
Wason Mfg. Co.

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Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

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Columbia Machine Works & M. I. Co.

Castings, Gray Iron and Steel
American Steel Foundries
Bemis Car Track Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Standard Steel Works

Castings, Malleable & Brass
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.

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Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas N.

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Archbold-Brady Co.

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Haskelite Mfg. Corp.

Ceilings, Plywood, Panels
Haskelite Mfg. Corp.

Chairs, Parlor Car
Heywood-Wakefield Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Change Trays
Cincinnati Car Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

Circuit Breakers, Oil
American Brown Boveri Elec. Corp.

Clamps and Connectors for Wires and Cables
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.

Clusters and Sockets
General Electric Co

Clutches
Long Mfg. Co.

Coil Banding and Winding Machines
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

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General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
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General Electric Co.
Westinghouse E. & M. Co.

Coin Changers
Illinois Motive Equip. Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

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Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

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General Electric Co.

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Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

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General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condensor Papers
Irvington Varnish & Ins. Co.

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Westinghouse E. & M. Co.

Connectors, Trailer Car
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Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.

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General Electric Co.
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American Steel & Wire Co.
Brill Co., The J. G.
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St. Louis Car Co.
Samson Cordage Works

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Samson Cordage Works
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Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.
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Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Culverts
Central Alloy Steel Corp.

Curtains & Curtain Fixtures
Brill Co., The J. G
Edwards Co., O. M.
St. Louis Car Co.

Dealer's Machinery & Second Hand Equipment
Lang Body Co.
Transit Equipment Co.
Van Loan Corp., Irving S.

Derailing Devices (See also Track Work)

Derailing Switches
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Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.

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Wish-Service, P. Edward

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Cincinnati Car Co.
Consolidated Car Heating Co.
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Cincinnati Car Co.
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General Electric Co.
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St. Louis Car Co.

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Electric Service Supplies Co.
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Westinghouse E. & M. Co.

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Railway Trackwork Co.
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Byllesby Co., H. M.
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Cincinnati Car Co.
Standard Steel Works

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
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Frogs, Track (See Track Work)

Frogs, Trolley
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Ohio Brass Co.
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General Electric Co.
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Fuses, Refillable
General Electric Co.

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Cincinnati Car Co.
St. Louis Car Co.

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Greases (See Lubricants)

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Railway Trackwork Co.

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Railway Trackwork Co.

(Continued on page 54)

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Lorain Special Trackwork
Girder Rails

Electrically Welded Joints

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We solicit a test of TULC
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National Railway Appliance Co.
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Feasible Drop Brake Staffs
Ft. Pitt Spring & Mfg. Co., Springs
Flaxlinum Insulation
Anderson Slack Adjusters
Power Saving and Inspection
Power Caving and Inspection Meters
"Topesealđ" Lamps
Bus Lighting Equipment
Cowdrey Automotive Brake Testing Machine

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(Continued on page 56)

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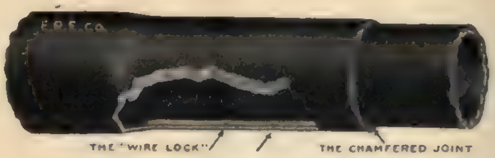

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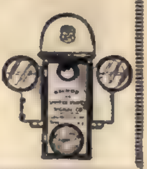

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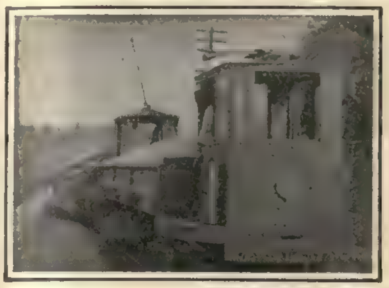

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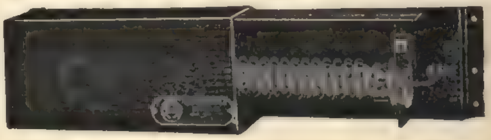

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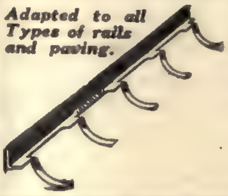

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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page

A

American Brass Co., The...... 55
American Brown Boveri Electric Corp. 16-17
American Car Co...........58-59
American Car & Foundry Motors Co. ....Insert 39-40-41-42
American Electrical Works..... 55
American Steel Foundries 6
American Steel & Wire Co..... 38
American Telephone & Telegraph Co. 32
Anaconda Copper Mining Co.... 55
Archbold-Brady Co........... 49

B

Babcock & Wilcox Co......... 49
Bates Expanded Steel Truss Co. 55
Beeler Organization 48
Bemis Car Truck Co.......... 56
Bethlehem Steel Co.......... 53
Brill Co., The J. G..........58-59
Buchanan & Layng Corp........ 48
Byllesby Engineering & Management Corp. 48

C

Cameron Electrical Mfg. Co..... 55
Carey Co., The Philip......... 37
Carnegie Steel Co............. 50
Central Alloy Steel Corp....... 18
Chillingworth Mfg. Co........ 53
Cincinnati Car Co...........30-31
Cleveland Fare Box Co........ 49
Cleveland Pneumatic Tool Co., The 43
Collier, Inc., Barron G........ 44
Columbia Machine Works, The. 50
Consolidated Car Fender Co.... 53
Consolidated Car Heating Co... 49

D

Day & Zimmermann, Inc....... 48
Dayton Mechanical Tie Co..... 10
Differential Steel Car Co., The.. 56
du Pont de Nemours & Co., E. I. 25

E

Edwards Co., D. M........... 28
Electric Equipment Co........ 51
Electric Ry. Equipment Co..... 55
Electric Service Supplies Co.... 9

F

Ford, Bacon & Davis.......... 48
"For Sale" Ads............. 51

G

General Electric Co....19-20-21-22
Godwin Co., W. S............ 56
Goodyear Tire & Rubber Co.... 24
Gold Car Heating & Ltg. Co.... 56

H

Hale-Kilburn Co.............. 49
Haskelite Mfg. Corp.......... 53
Heywood-Wakefield Co........ 29
"Help Wanted" Ads.......... 51
Hemphill & Wells 48
Holst, Englehardt W.......... 48
Hubbard & Co. 56

I

Illinois Motive Equipment Co.. 49
Illinois Steel Co.............. 34
International Register Co...... 49
International Steel Tie Co., The. 7
Irvington Varnish & Insulator Co. 49

J

Jackson, Walter 48
Jeandron, W. J............... 46

K

Kelker, DeLeuw & Co........ 49
Kuhlman Car Co............58-59

L

Lang Body Co................ 51
LeCarbone Co................ 46
Linn & Marshall, Inc......... 48
Long Mfg. Co................ 27
Lorain Steel Co.............. 53

M

McClellan & Junkersfeld 48
McGraw-Hill Book Co......... 47
Morganite Brush Co., Inc...... 47

N

Nachod and U. S. Signal Co.... 55
National Brake Co., Inc....... 23
National Pneumatic Co........ 15
National Ry. Appliance Co.... 53
Naugle Pole & Tie Co......... 56
Nichols-Lintern Co........... 53
Nuttall Co., R. D............ 50

O

Ohio Brass Co............... 5
Okonite-Callender Cable Company, Inc., The............. 55
Okonite Co., The............. 55

P

Perey Mfg. Co., Inc.......... 56
Positions Wanted and Vacant... 51
Public Service Engineering Bureau 48

R

Rail Joint Co., The........... 46
Railway Track-work Co........ 4
Railway Utility Co........... 56
Ramapo Ajax Corp........... 55
Richey, Albert 48
Roebling's Sons Co., John A.... 55

S

St. Louis Car Co............. 33
Samson Cordage Works........ 55
Sanderson & Porter........... 48
Searchlight Section 51
Six Wheel Co., The........... 26
Smith Heater Co., Peter...... 56
Standard Steel Works Co...... 46
Star Brass Works............ 56
Stevens & Wood, Inc.......... 48
Stone & Webster 48
Stucki Co., A................ 53
Studebaker Corp. of America, The ....Insert 11-12-13-14

T

Thomas Car Works, Perley A... 35
Timken-Detroit Axle Co. Back Cover
Timken Roller Bearing Co., Front Cover
Transit Equipment Co......... 51

U

Una Welding & Bonding Co.... 49
Universal Lubricating Co...... 53

V

Van Loan, Irving S........... 51

W

"Want" Ads 51
Wason Mfg. Co.............58-59
Westinghouse Electric & Mfg. Co. 2
Westinghouse Traction Brake Co. 8
Wharton, Jr. & Co., Inc. Wm. 53
"What and Where to Buy," 52-54-57
Wish Service, The P. Edw.... 49
White Eng. Corp., The J. G.... 48
Wood Co., Chas. N........... 55

WHAT AND WHERE TO BUY—Continued from page 54

Trolley Material, Overhead
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Trolley Wheel Bushings
Star Brass Works

Trolley Wheels (See Wheels Trolley)

Trolley Wire
Amer. Electrical Works
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Min. Co
Roebling's Sons Co., J. A.

Trucks, Car
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.

Truss Planks
Haskelite Mfg. Corp.

Tubing, Yellow and Black Flexible Varnish
Irvington Varnish & Ins. Co.

Turbines, Steam
American Brown Boveri Corp.
General Electric Co.
Westinghouse E. & M. Co.

Turntables
Elec. Service Supplies Co.

Turnstiles
Elec. Service Supplies Co.
Perey Mfg. Co., Inc.

Valves
Ohio Brass Co.
Westinghouse Tr. Br. Co

Varnished Papers and Silks
Irvington Varnish & Ins. Co.

Ventilators, Car
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
Nichols-Lintern Co.
Nat'l. Ry. Appliance Co.
Railway Utility Co.
St. Louis Car Co.

Vestibule Linings
Haskelite Mfg. Corp.

Welded Rail Joints
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Welders, Portable Electric
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co
Westinghouse E. & M. Co.

Welders, Rail Joint
Ohio Brass Co.
Railway Trackwork Co.

Welding Processes and Apparatus
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Welding Steel
Railway Trackwork Co.
Una Welding & Bonding Co.

Welding Wire
American Steel & Wire Co.
General Electric Co.
Railway Trackwork Co.
Roebling's Sons Co., J. A.

Welding Wire and Rods
Railway Trackwork Co.

Wheel Guards (See Fenders and Wheel Guards)

Wheel Presses (See Machine Tools)

Wheels, Car, Steel & Steel Tire
American Steel Foundries
Bemis Car Truck Co.
Carnegie Steel Co.
Illinois Steel Co.
Standard Steel Works

Wheels, Trolley
Columbia Machine Works & M. I. Co.
Elec. Ry. Equipment Co.
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Wheels, Wrought Steel
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General Electric Co.
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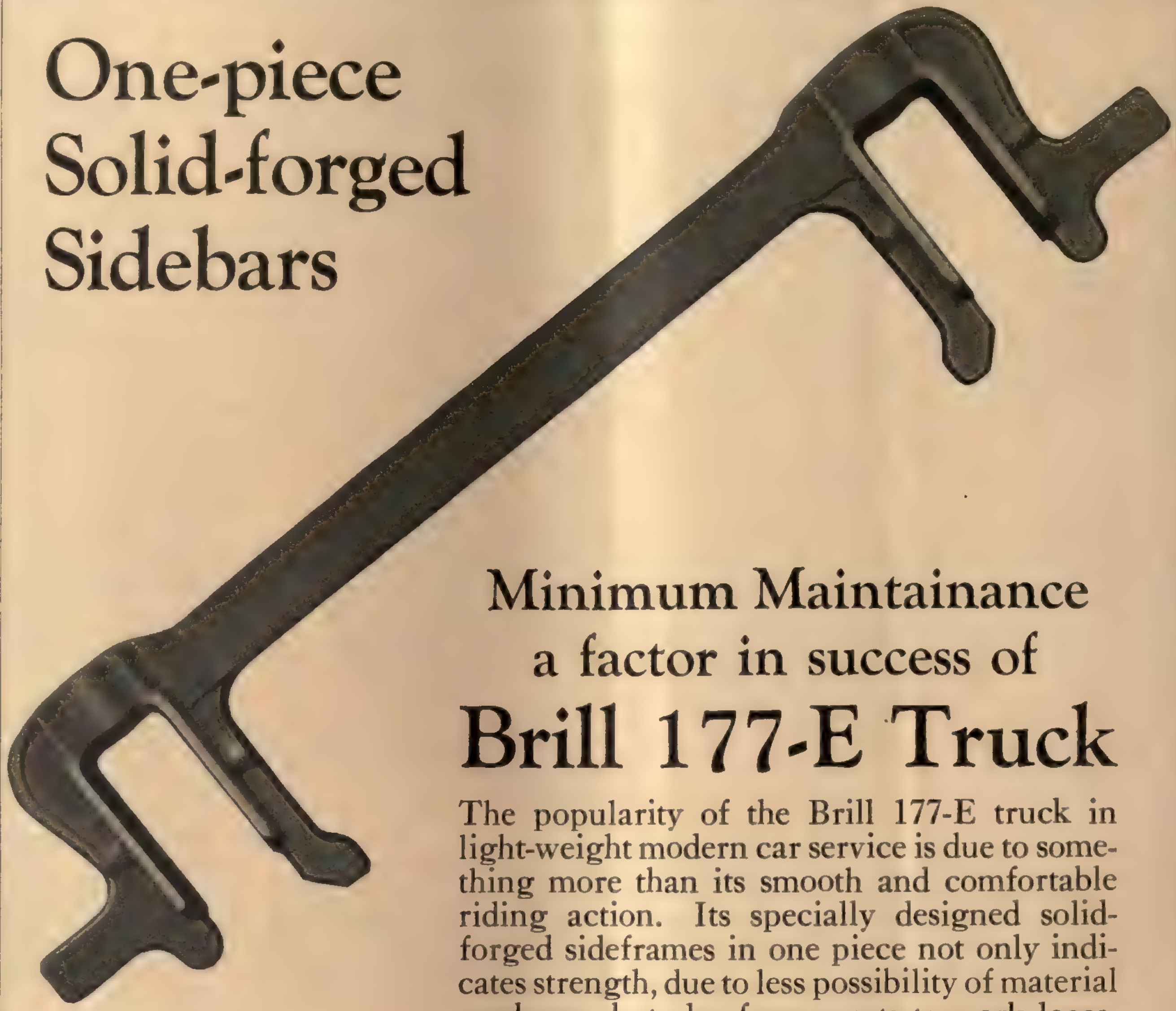

Minimum Maintainance a factor in success of

Brill 177-E Truck

The popularity of the Brill 177-E truck in light-weight modern car service is due to something more than its smooth and comfortable riding action. Its specially designed solid-forged sideframes in one piece not only indicates strength, due to less possibility of material weakness, but also fewer parts to work loose. Annealing the 177-E truck solid-forged sideframe is another reason why low maintenance is an important characteristic of this popular type truck.

Durability and wear resistance of solid-forged sideframes augment superlatively good riding action. Sidebars guaranteed against breakage except in collision or derailment.

"Recommended by Proven Merit"

Described and illustrated in Bulletin 306.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MANF'G CO.
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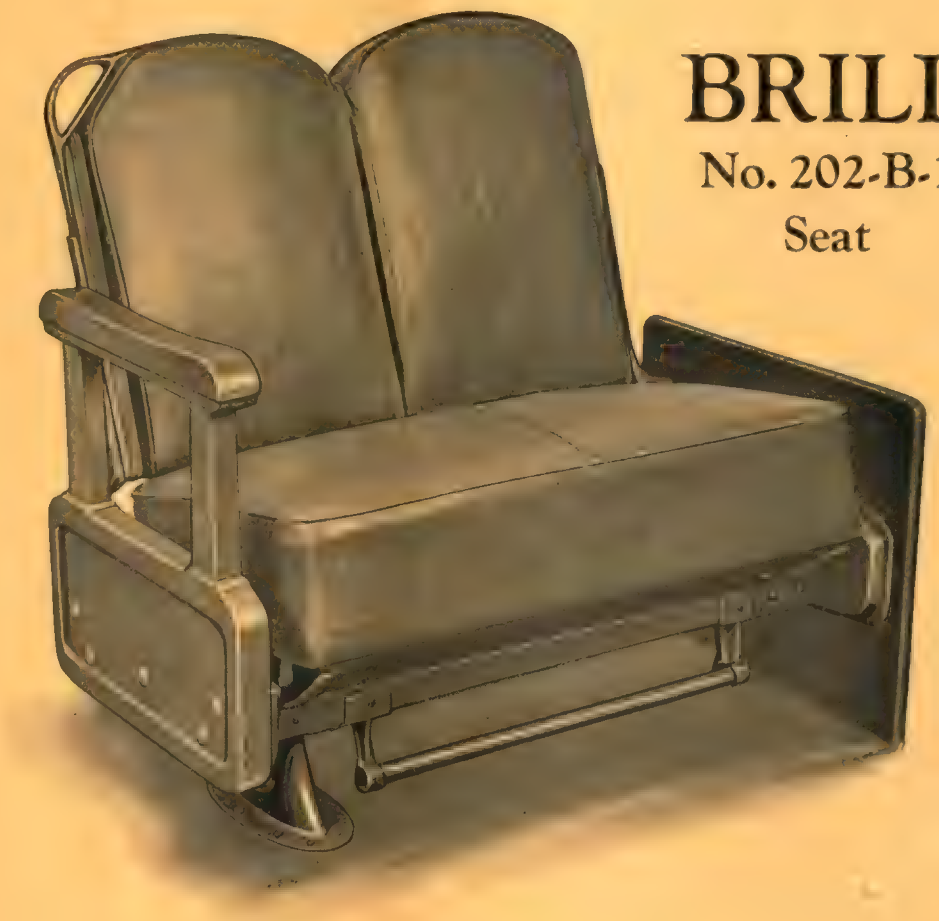

BRILL
No. 202-B-1
Seat

An Interurban Car Seat of Distinction

The unusually comfortable slope to cushion and pitch to back permitted by the new Brill seat reversing mechanism has now been applied to interurban car seats represented by the Brill No. 202-B-1 type illustrated. This mechanism is not only positive in reversing action but its simplicity and strength recommend it for long and satisfactory service. Its development is the result of a wide experience in seat construction.

A double-deck spring cushion construction and a soft two-part semi-individual back also contribute to that high degree of comfort so essential in high-speed interurban service.

The Brill No. 202-B-1 Seat is particularly adapted to the lighter weight modern types of interurban cars.

Complete information upon request to

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The Nation's Capital rides on Timken Axles

PEOPLE use motor coaches to get to their destinations—quickly, comfortably, *surely.* In Washington, as in most of the big cities, you'll find a strong preference for coaches equipped with Timken Axles—as the surest way to avoid axle troubles.

17 coaches operated by The Capital Traction Company have traveled over 1,500,000 miles. They are all on Timken's front and rear; and the company says it has "exceptional service from the Timken equipment."

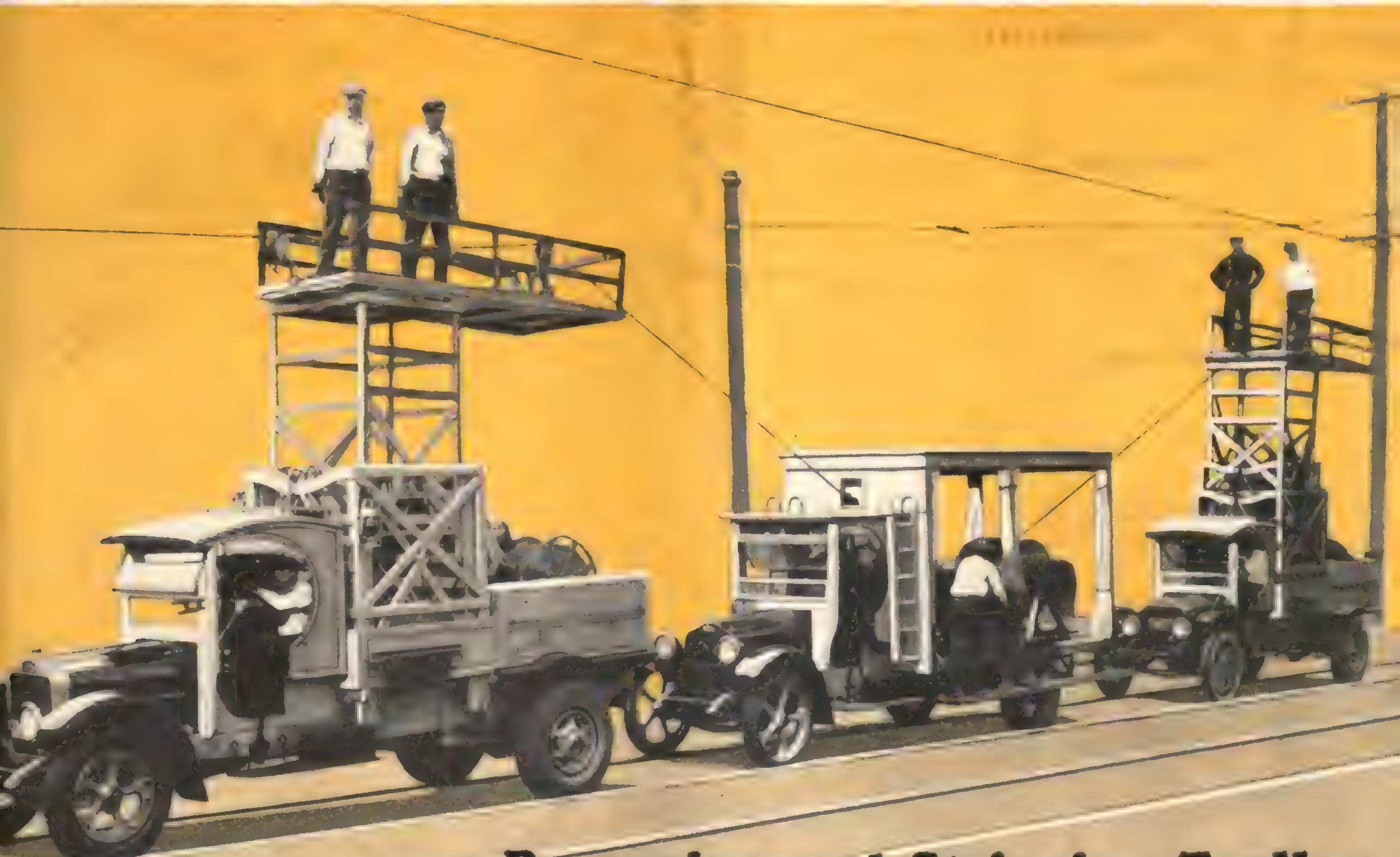
The Washington Railway and Electric Company has 39 coaches, which have Timken Axles, front and rear. Their total mileage is 1,869,795; and they report "very satisfactory service; no axle trouble of any kind."

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN
AXLES

Graw-Hill Publishing Company, Inc. June 4, 1927 Twenty Cents per C

ELECTRIC RAILWAY JOURNAL



Removing and Stringing Trolley Wire at the Same Time

Using two White Tower Trucks and special reel equipment mounted on a White Truck chassis, the Cleveland Railway Company has effected large savings in the removal and restringing of trolley wire. Both operations are performed at the same time without interrupting traffic.

The first tower truck removes the trolley wire. It is wound on one of the reels. Before stringing, the desired tension of the reel of new wire is set. The new wire is then tied upon the span wires by the crew of the rear tower truck.

By this method a mile of trolley wire may be strung, taken down and virtually all insulated in 2¼ hours.

Time is saved. Labor is saved.

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DFC
THE BROOKLYN CITY RAILROAD COMPANY
SPECIAL ACCOUNT
PAY TO THE ORDER OF
ACCIDENT PREVENTION BONUS – AUGUST 1ST 1926 TO ...BER 30TH, 1926
To Brooklyn Trust Company
Brooklyn, N.Y.
1–102
UNIVERSAL ~ SAFETY ~
BROOKLYN CITY
SPECIAL A

~and throngs to the trolleys!

NEW patrons are first attracted to trolleys by generally efficient service. This, the Brooklyn City Railroad Company assured by purchasing modern, light-weight cars, constructed to give the utmost in speed. The second spur to increased patronage was found in enhancing the safety features of the car's construction. This has been accomplished by bringing the car-crews "in step" with the idea of safety as an added factor in street-car handling.

Wide-spread publicity attracted the attention of potential patrons to the fact that the Brooklyn City company was offering a special "safety check" to those motormen and conductors whose cars had been free of accidents for a thirty-day period.

Unusual care was maintained by the car crews over the experimental months, and statistics showed the accident list to be lessening and the patronage increasing.

An increased net profit was found in the saving from accident adjustments and in the multiplied patronage. Goodwill, too, has been established with the patrons who now find the trolley not only more convenient, but safer than the automobile for use on streets of congested traffic.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA
1927

Westinghouse

X91042

Westinghouse 510-A 35 hp. motors and K controls comprise the equipment on many of the Brooklyn City Railroad Company's cars.

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Vol. 69
No. 23

CONTENTS

Pages
985-1024

JUNE 4, 1927

Editorials 985

Good Service in Attractive Cars Increases Riding ..988
BY E. J. DICKSON.
Passenger revenue of the United Electric Railways, Providence, R. I., increased 2.3 per cent from 1923 to 1926 despite extraordinary depression in business conditions and increased automobile registration of nearly 46 per cent.

Lexington Capitalizes on Air Magnetic Brake Installation 990

Pressure Shower Bath Speeds Up Car Washing 990

Traffic Signals Fitted to Complicated Intersections .991
BY L. M. TRAISER.
Special methods of signal control are employed at complicated crossings in Chicago to increase flexibility of traffic movements, reduce interference and cut delay at intersections.

New Cars for Jamestown Street Railway 994
Eight new one-man de luxe safety cars were purchased and an attractive new color scheme adopted. No expense was spared in making these cars the latest in car construction.

Enviable Service Records in New York State 995

Store Check at South Bend Shows Popularity of Railway 995

Trackless Trolley Equipped with Pneumatic Tires .996

Schedule Making and Checking in Los Angeles 997
The methods used by the Los Angeles Railway follow somewhat unusual lines. The method of procedure from the traffic check to the finished schedule is discussed.

Another Chapter on Popular Transportation 1000
Six semi-modern cars, rebuilt by the East St. Louis Railway from the ground up, were turned over the the public on May 11.

Terminal Improvements on West Penn System ...1001

N. O. P. & L. Bus School Completes First Year ...1002

A Signal School in a Tunnel 1003
Classes for employees are held by London Underground Companies in unused section of South Kensington tube twice a week. Models of many kinds of signal apparatus are available for study.

Maintenance Notes 1005

Association News and Discussion 1008

Economics of Railroad Electrification 1008
BY SIDNEY WITHINGTON.

American Association News 1010

News of the Industry 1011

Financial and Corporate 1015

Legal Notes 1018

Personal Mention 1019

Manufactures and the Markets 1022

A Lot of Us

"Can't See for the Looking"

AFTER days and months of concentrating on the job, a lot of us "can't see for the looking." Our perspective is foreshortened. We try to pull a toy express wagon with a span of dray horses. We feel sorry for ourselves. Details are magnified into problems; problems become projects. We are as welcome on the property as a mouse at an old maid's party.

Such a condition is the result of one or two things. Either conceit or our failure to look out the window at what the other fellow is doing. There is no better way to look out on the world of our profession than by reading a live, authoritative publication. It is then that our mountains become molehills and we discover that there is no necessity for squeezing through the eye of a needle. Compared with the other fellow's problems and achievements, our plans, often petty, are solved in a moment.

The brain, like the body, needs a tonic every now and then. The brain's greatest tonic lies in the exchange of ideas. Here is where your JOURNAL should step in. It is a clearing house for mental achievements and a stimulant for jaded brains. Give it the opportunity to lift your nose from the grindstone and at the same time snatch away the "blinders."

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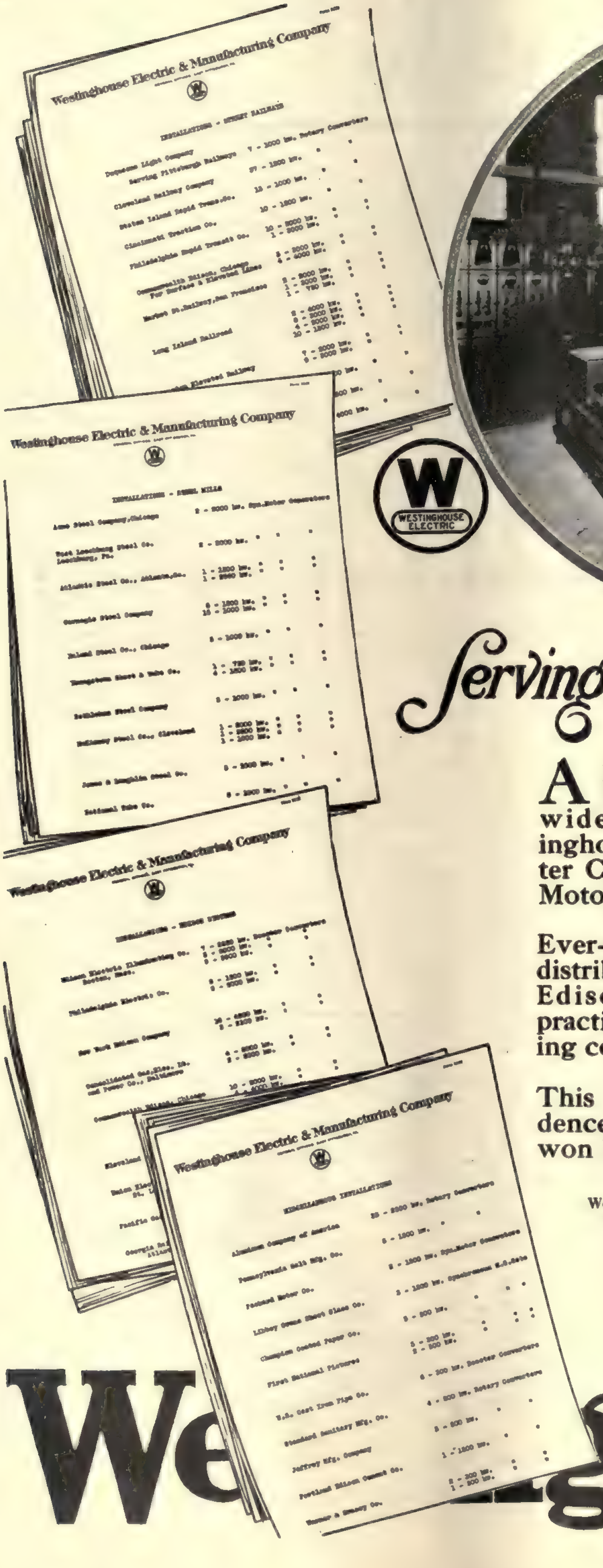
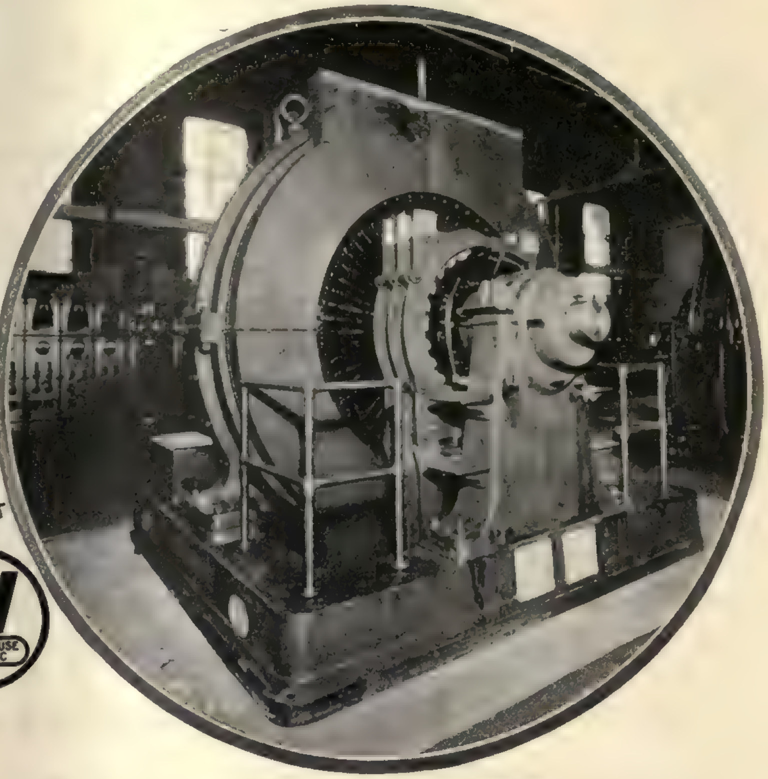




WESTINGHOUSE ELECTRIC

Serving Many Industries

A partial list of users, nationally known, serves to indicate the widespread acceptance of Westinghouse Rotary Converters, Booster Converters, and Synchronous Motor Generators in many industries.

Ever-growing lists of orders show distribution among street railways, Edison systems, steel mills, and practically all other industries requiring conversion of current.

This widespread customer-confidence and this acceptance have been won by reliability of performance.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

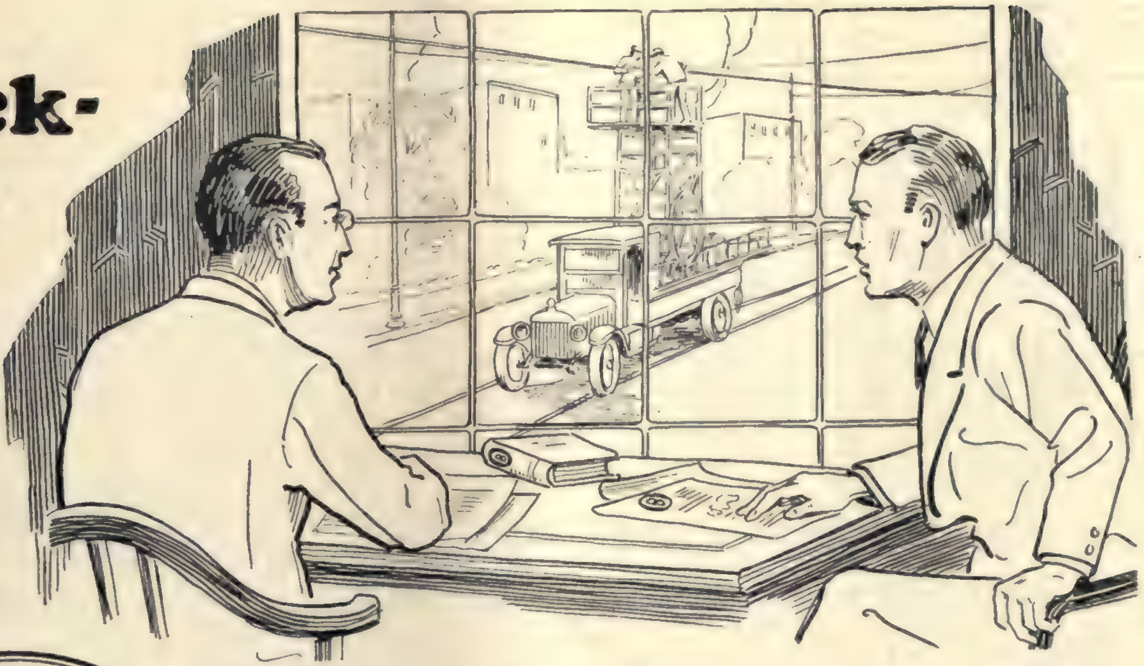
MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA
1927

Westinghouse

X90099

Check-up

time to profit by O-B Line Material Results



for instance—

Marathon Ears

Catalog page 534

BC Frogs

Catalog page 573

Lock Hangers

Catalog page 467

Type C Splicer

Catalog page 542

Live Crossover

Catalog page 579

Write for detailed information

Increase Net Income
By Reducing Up-Keep

ALTHOUGH passenger revenues continue to mount steadily, progressive properties are not depending entirely on increased traffic for larger earnings in 1927. Many properties are realizing that savings in operating expense, every dollar of which equals the net income received from 250 or more additional passengers, *are* possible—particularly through the use of modern O-B Line Materials.

Take Marathon Ears, with service records of 350,000 car passes and more, as an example. Properties using Marathon Ears report from two to three times the length of service formerly received per ear. Furthermore, line breaks have been reduced as much as 46 percent with the use of Marathons. The saving amounts to thousands of dollars yearly in some instances.

Other O-B Line Materials—Frogs, Cross-Overs, Hangers, Splicers,—effect similar worth while economies in operation. It is on the basis of their ability to increase net income by reducing operating expenses that O-B Line Materials have won industry-wide recognition and usage.

Take advantage of your next "Check-Up" by replacing worn out overhead materials with modern, long-life O-B Materials.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
344B

Ohio Brass Co.

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

SAVING THE RAIL SAVES THE RAILWAY

It pays to look prosperous

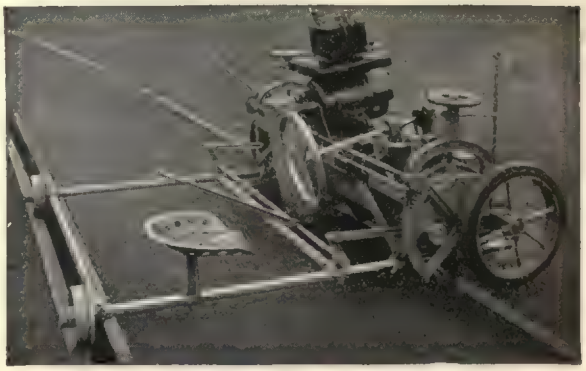
A road that presents a down-at-the-heels appearance may expect to be treated as a failure.

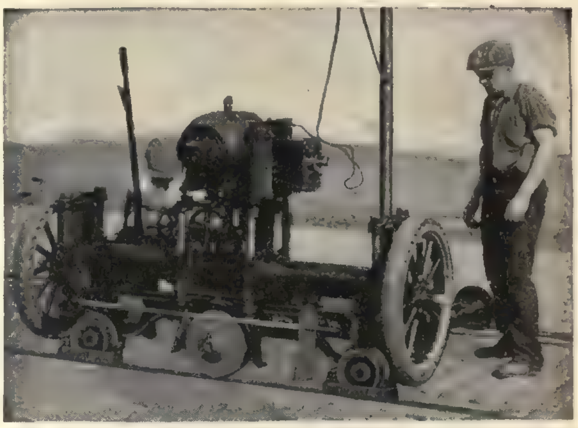
Look prosperous. Any road can do it without extensive financing.

Battered, corrugated rails are a needless sign of distress. They're more — they are a source of constant expense.

Owning well maintained track costs less than doing nothing toward having it. Rail maintenance is economical with the modern grinders and welders we offer.

Do you know the entire line?
Complete details are yours for a word.


"Improved Atlas" Rail Grinder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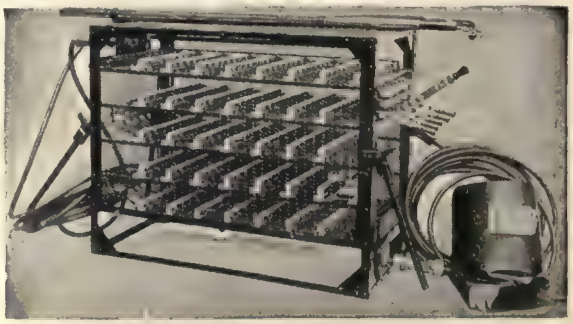
Reciprocating Track Grinder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Railway Trackwork Co.
3132-48 East Thompson Street, Philadelphia

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Chas. N. Wood Co., Boston
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H. F. McDermott, 208 S. LaSalle St., Chicago
P. W. Wood, Railway Supply Co., New Orleans, La.
Equipment & Engineering Co., London
Frazar & Co., Japan

1810

SAVING THE RAIL SAVES THE RAILWAY

always

hand in hand

NEW cars and new track—should always go hand in hand. Pounding new cars to pieces on old track is an expensive operation. New cars on new track will pay bigger dividends—right from the start. It is significant that Steel Twin Tie Track construction is being used in the large installations throughout the country. On Steel Twin Ties the rails are held permanently in place, new rails may be laid right on the old foundation, and the car mile cost for track construction and maintenance is surprisingly low.

Have you your copy of the Paved Track Note Book? Can we tell you more about Twin Tie Track construction?

The International Steel Tie Co.
CLEVELAND, OHIO

"Look it up in your "Paved Track" Note Book"

Steel Twin Tie Track

Balanced Braking

In line with modern principles

Higher rates of retardation are demanded as a part of the program of speedier suburban and street railway service. With two brake shoes per wheel instead of one, the clasp brake is admirably suited to producing maximum retarding effect, with minimum strain and wear on truck and journal parts.

Balancing the heavy braking forces on opposite sides of the wheel has many advantages

1. **Less journal box wear.**
2. **Permits wheel to follow freely, vertical inequalities in track.**
3. **Makes use of flanged brake shoes practical.**
4. **Higher co-efficient of friction.**
5. **Divides energy absorption between two shoes, thus reducing heating effect from brake application.**
6. **Reduces frequency of brake shoe replacements on the car.**

AMERICAN STEEL FOUNDRIES
NEW YORK CHICAGO ST. LOUIS

American Multiple Unit Clasp Brake

Lighting Fixtures

THE bright, steady, well-diffused light provided by these lighting fixtures is a practical necessity in well-equipped cars. Manufactured to the Keystone standard of quality, these lighting fixtures are both ornamental and durable. They add attractiveness and increase patronage.

If you have in mind a remodeling program or a new car building program, in ESSCO Catalog No. 7 you will find a complete line of Keystone Car Specialties that provide for increased attractiveness, comfort, convenience and safety.

Ask for your copy of ESSCO Catalog No. 7.

ELECTRIC SERVICE SUPPLIES COMPANY
PHILADELPHIA, 17th & Cambria Sts.; NEW YORK, 50 Church St.; CHICAGO, ILL., Merchants Bank Bldg.; Pittsburgh, Bessemer Bldg.; Boston, 88 Broad St.; Detroit, General Motors Bldg.; Scranton, 316 N. Washington Ave.; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

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MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

WESTINGHOUSE "VARIABLE LOAD" BRAKE

gives Uniform Braking with Varying Load

STABILIZED STOPABILITY throughout the entire range of car-loading means—

—safe and swift car movement, through congested districts;

—ability to hold traffic position with other moving vehicles, inasmuch as peak speed can be held longer between stops;

—a precise and systematic movement of shopping and business crowds;

—seconds saved, that may collectively be counted as dollars;

—stimulation of public good will, through a gratifying on schedule record over the entire system.

Many traction companies, recognizing the auspicious part Westinghouse Variable Load Brakes can play in effecting these far-reaching advantages, are specifying this new type equipment for their new modern light weight cars.

Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office—

Ask for Descriptive Catalogue T-2045.

Westinghouse Traction Brake Company
General Offices and Works: Wilmerding, Pa.

WESTINGHOUSE TRACTION BRAKES

Up went earnings
Down went costs

When the Pittsburgh
Motor Coach Company
switched to

YELLOW
COACHES

Turning losses into profits

YELLOW

FORMER EQUIPMENT: *earnings 29 cents*
YELLOW COACHES: *earnings 32.3 cents*

Yellow Type X Motor Coaches have proved their earning ability to the Pittsburgh Motor Coach Company as against equipment of other makes when they substituted Yellows on their de luxe 25-cent fare routes.

Comparative records of earnings and costs furnish indisputable evidence of the increased earning power of Yellow Coaches, which, on December 6, 1926, replaced other makes of heavier equipment. At higher speeds, Yellow Coaches have definitely reduced costs and increased revenue.

For example, before the change to Yellow Coaches was made, the month of November showed a gross earning on the Point Breeze Route of $167 a day. Under Yellow Coach operation, December showed earnings of $301 a day—

with

COACHES

costs 32 cents
costs 26.35 cents

Earnings of 29 cents per mile as against 32.3 per mile, when Yellow Coaches took the place of former equipment.

Costs of 32 cents per mile as against 26.35 cents per mile when Yellow Coaches serviced the route. Running time was cut from 38 to 30 minutes. In each case the fare was the same —25 cents. The gauge of comparison is identical.

Today, 22 Yellow Type X Motor Coaches are operating over three de luxe routes, the longest 7.1 miles, the shortest 6.2 miles, carrying 90,600 passengers per month at a 25-cent fare and piling up a monthly average of 70,400 miles.

Each route serves a high class, residential section and carries passengers into the heart of the business and shopping centers of Pittsburgh.

And revenues are rapidly increasing—from $740 the first week on one route, for example, to $1,192 the fourth week.

As for performance, Yellow Coaches ran 150,000 miles without a pull-in; a distance equivalent to crossing the continent fifty times, from coast to coast.

From the standpoint of increased earnings, reduced costs at higher speeds and dependable performance, Yellow Coaches have proved their superiority. Comparative figures, not guesswork, make the evidence conclusive.

The strain of service *is severe* in PITTSBURGH

Consider the conditions under which Yellow Coaches must operate, when studying these cost figures.

Pittsburgh routes are hilly. There is one 14 per cent grade, 1,000 feet long. Another of the same length averages 12 per cent. Still another, 3,000 feet long, is a 10 per cent grade, and added to these is an 8 per cent grade of 6,000 feet.

In the downtown section, streets are narrow and traffic is heavy. The relation of these operating conditions to costs per mile is a tribute to the given figures.

Whether your operation extends over flat or hilly country, in congested business centers or along open highways, the vast transportation and manufacturing experience of Yellow Coach *plus* General Motors is always at your service to increase your revenue and keep down your operating costs.

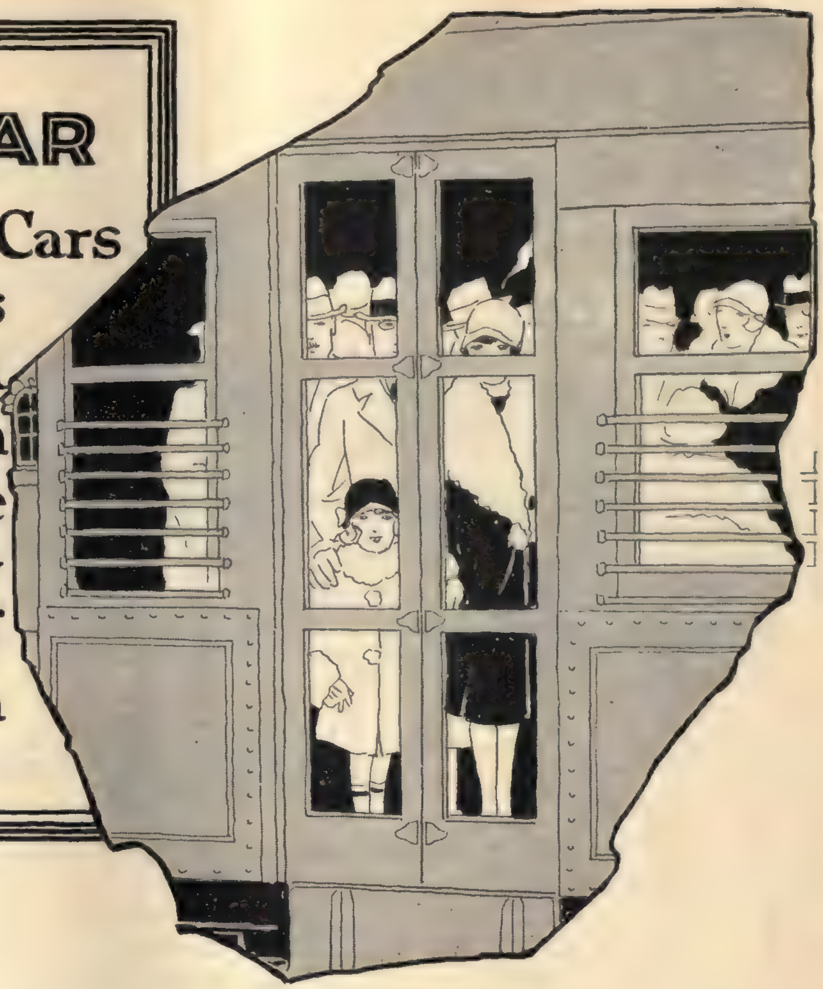
Operating costs
26.35 Cents per mile

	Cents per Mile
Transportation	
Operators' Wages	5.35
Gasoline	2.40
Lubricants	0.38
Other Transportation Supplies	1.68
Total	9.81
Maintenance	
Buildings	1.64
Coach Bodies	0.38
Coach Chassis	1.66
Tires and Tubes	1.24
Depreciation	3.50
Miscellaneous	0.68
Total	9.10
Garage Operation	
Garage Employes	0.83
Garage Supplies and Expenses	0.69
Total	1.52
Traffic Promotion	
Advertising	0.21
General and Miscellaneous	
Officers' and Clerks' Salaries	1.21
Insurance	1.72
Miscellaneous and General	1.25
Total	4.18
Taxes	1.53
Operating Expenses and Taxes	26.35

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.

EVERY YEAR

Electric Railway Cars carry millions of people and carry them with greater average safety than any other medium of transportation



THE street car is the safest vehicle on the streets because, with greater carrying capacity, it is generally conceded right of way while always under positive control. It is controlled, moreover, not only in the movements which relate to other vehicles but it actually ***exerts*** control upon the movements of its riders. Through NP Door and Step Equipment, the boarding and alighting passengers are guarded simultaneously against movements of the car, carelessness of operators and their own mistakes.

NP

NATIONAL PNEUMATIC COMPANY

Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

Selling A Better Service

- - - - *at an economic gain*

Safety Cars are modern cars, whether they be new cars, or old equipment adapted to Safety Car Devices Control.

Safety Cars are modern cars, inasmuch as their feature of concentrated control, permits the operation of more cars, at faster schedules, at no increase over old operating costs.

Safety Cars stimulate public good-will, by affording better service, at better schedule speeds, which means increased patronage.

Safety Cars do Sell A Better Service at an economic gain, which accounts for their nation wide acceptance.

SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

"We make the Safety Car Control Devices which make the Safety Car."

Cincinnati *New* Trucks

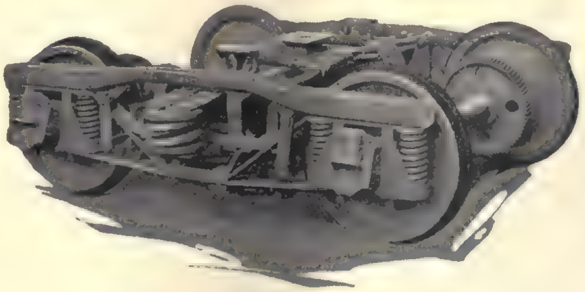
Lightness—Silence—Speed
coupled now with easy riding and economical maintenance

Lightness—silence—speed, a far cry indeed from the electric railway car of twenty years ago. Yet these standards are being demanded today by the laws of good business policy, and insistent public opinion. Hence the growing interest in truck design. For this is where more than half the battle must be won.

The Cincinnati Car Company has faced this problem squarely. As specialists in the development of the lightweight car, it has been necessary for us to develop concurrently trucks of such advanced design that the ends of lightweight car operation would not be defeated by indifferent truck performance.

Two truck types have now been standardized. One a high speed interurban unit, equipped with the Magnetic Brake and with radically redesigned suspension to eliminate nosing and sidesway at speeds up to 60 m.p.h. The other a city type truck of the arch-bar type, characterized by greatly improved riding qualities, and elimination of the noise arising from brake rigging.

Both of these trucks have been made LIGHTER by simplification of construction and the use of high carbon alloy steels. They have been made QUIETER by drastic dampening and elimination of many old-time noise centers. They have demonstrated EASY RIDING QUALITIES far in advance of conventional types.



We will gladly submit blue prints and full engineering data to any executives interested in the purchase of new cars or of new trucks for installations under existing equipment.

CINCINNATI CAR COMPANY
Cincinnati, Ohio

CINCINNATI
New
CARS

~A step ahead of the modern trend

You want to know!
He wants to know!

How to Improve Operation to Meet Present Day Conditions

Both management and employees are rapidly acquiring a mutual interest in methods of improving operation. Enlist the cooperation of your motormen. Give them a record of their performance. The ECONOMY Meter is a welcome tool which assists each man to improve by showing him his operating efficiency.

It shows each motorman just how much energy his car uses. Few men are willfully wasteful. Saving energy improves car operation.

Because the ECONOMY Meter measures what he is trying to save, the motorman can satisfy himself as to the most economical methods of operation.

His interest is held and he *does save.*

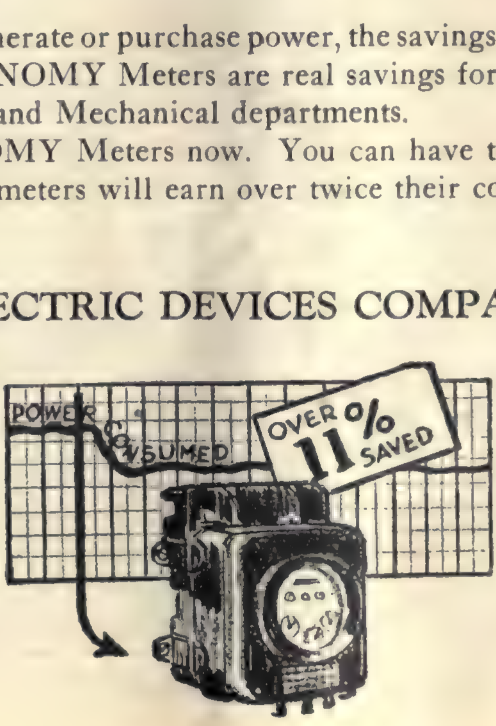
ECONOMY METERS

To your Mechanical Department the Car Inspection Dial automatically announces the inspections due directly in accordance with the actual work that the equipment has done. No clerical work is necessary.

Whether you generate or purchase power, the savings effected through the use of ECONOMY Meters are real savings for the Transportation, Electrical and Mechanical departments.

Install ECONOMY Meters now. You can have two years to pay. Meanwhile the meters will earn over twice their cost. May we tell you more?

ECONOMY ELECTRIC DEVICES COMPANY, CHICAGO



"Have your fares ready please — *there's a crowd behind you!*"
6
LAMAR
STATE
McMURRAY

Memphis paid $475,000 to hear those welcome words

And Memphis accomplished what any other city of moderate size can do by following a conservative, constructive program of modernization.

Yet the management of the Memphis Street Railway knows that from an accounting standpoint, $475,000 was merely diverted from a constantly increasing maintenance account to a capital investment in 32 St. Louis Quality rail coaches, which gave them an equivalent addition to their property value.

Aside from maintenance savings, power economies, increased revenues and other tangible returns, the modern light-weight Quality Cars have an intangible value in eliminating delays and interruption to service which can never be evaluated accurately in terms of dollars.

Automatic Safety features, de luxe seats, wider vision windows easily operated, adequate illumination and ventilation, attractive in appearance—these by-products of improved cars build that good will on which increased patronage depends.

Memphis can well be proud of its street railway. Are you proud of yours?

built by

St. Louis Car Co.

Quality Cars

Shopping for Transportation

NOT many years ago the traveling public shopped for rides. A variety of vehicles gave them a variety of choice. If a bus ride at ten or fifteen cents the trip seemed to represent more value, novelty, or comfort than a ride on rails at the lower rate, they chose the former.

This practice may still be followed but, in most localities, the choice among vehicles has been so narrowed—routes have been so well co-ordinated and related—fares have been so carefully adjusted to the value of the service—that choice becomes a matter of expediency—not of fashion, prejudice, or whim.

Modern transportation systems, like modern department stores, strive to meet *every need* of their patrons in a manner which removes all temptation to shop elsewhere.

General Electric pursues a similar course in anticipating the requirements of railways. Shop men who, perhaps, at one time, shopped for their materials at different sources, have found G-E stocks of parts and mechanisms so complete, prices so carefully related to quality and value, standards so undeviating, that they have no need and no temptation to shop elsewhere.

The General Electric Company's warehouse service is the modern department store of the Railway Industry. The purchase of renewal parts from a single supply source simplifies accounting and storekeeping, and insures original equipment quality.

330-47

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 4, 1927 *Number* 23

Comfortable Seats Increase Car Earnings

FARE box receipts are of necessity the acid test of policy on an electric railway property. But it is often difficult to calculate exactly the financial effect of any particular innovation. Determination of the dollars and cents value of comfort and attractiveness in car design is an instance of this kind. Every one knows in a general way that passengers prefer attractive cars and comfortable seats. How strong is this preference? Before spending money on rolling stock improvement, the prudent manager wants to know that he will get back a fair return on his investment.

Recently twelve of the newest cars on a large electric railway in an Eastern city were reconditioned, equipped with leather bucket seats and linoleum floor covering and repainted outside in a different color. During the day these cars furnish about half of the service on the line where they are operated, and during rush hours about one-quarter of the service. Revenue per car-hour for the entire line averages approximately $4.75, while that for the new cars alone is approximately $5.50. Thus the improved cars are earning 75 cents per hour more than the general average, and about a dollar an hour more than the older cars. It is significant that the revenue of the comfortable cars is above normal for that particular line, while that of the others remains about the same as it has been for some time past. The difference in revenue therefore represents a definite traffic increase due to the improvement.

The foregoing instance is unusual only in that the relation between cause and effect is so clearly discernible. Advance calculations of this relationship are difficult, if not impossible, but the electric railway industry now has had enough experience with attractive cars to convince the doubtful that money spent in rolling stock improvement is a dividend-paying investment.

Are Convention Exhibits Worth the Costs?

AT A GATHERING of street railway men that assumes the magnitude of the annual convention of the American Electric Railway Association, the necessity for exhibits is so obvious that it would hardly need stressing, were it not that there are some manufacturers who still believe an intricate piece of mechanism can be promoted adequately in the abstract by means of a high-powered sales talk. The majority of us want to see and to examine. We want, if you please, an outward visible sign that the machine or appliance can actually perform what its builder claims. Further, we want to discuss the merits of this or that mechanism with our co-workers, whose opinions we respect. And last, but not least, we want to take back to our superior officers something besides speeches and resolutions.

Convincing arguments in favor of exhibits are found in a short review of the attendance records at the exhibits and exhibitless conventions of the association. Excluding the years 1917 and 1918, when the war prevented any exhibits, the records stand as follows:

Year	Convention City	Registration	Manufacturer Company Members	Number of Exhibitors	Total Space Sold, Sq.Ft.
1916	Atlantic City	3,271	208	125	57,329
1919	Atlantic City	3,166	206	157	62,219
1920	Atlantic City	3,300	200	136	59,529
1921	Atlantic City	1,189	225	No exhibit	No exhibit
1922	Chicago	4,200	244	141	61,895
1923	Atlantic City	4,404	274	162	75,681
1924	Atlantic City	5,804	330	192	86,349
1925	Atlantic City	7,147	371	204	100,030
1926	Cleveland	8,623	423	271	119,007

Is this not reason enough for asking: Is the exhibit worth its cost to the manufacturer? Take the tabulation for 1920, when there were 3,300 registrations with 136 exhibitors and 50,529 sq.ft. of space sold. Compare this with 1921, when, through fear of the financial depression, no exhibit was held. Look at the convention registration and then glance at these same figures for 1922. Thus there is ample justification for bigger and better exhibits.

Radio Interference Complaints Are Annoying, but Result in Better Maintenance

CAUSES and remedies for radio interference brought out lively discussion at a meeting of the New England Street Railway Club held in Boston on May 12, as told in this paper last week. It was generally agreed by those present that this added responsibility must be assumed by the electric railways and that most of them now are making every possible effort to eliminate causes of radio interference.

Although the receipt of numerous complaints from residents along electric railway lines is annoying to the electric railway officials, the correction of the troubles, after the real reason for the disturbance has been found, affords an excellent chance for the railway to build good will among its patrons. Where some part of the railway equipment is at fault, location of the cause of radio interference results in a higher grade of maintenance and in some cases avoids troubles which eventually would prove serious.

Experience of those who discussed the subject of causes for radio interference at Boston shows that the interruption of small currents is the most disturbing factor. The greatest amount of interference to radio reception appears to be caused by currents of such small intensity that their interruption causes sparks rather than arcs. Interference from the ordinary heavy current flows over wires and tracks, if the circuits are in good condition, should be negligible.

Disruptive discharges which may be termed accidental are very hard to trace. These include many types of leaks or grounds which are increased by atmospheric or wind conditions. Such arcing is usually intermittent and may be caused by tree grounds or the swinging and vibration of overhead lines. Interference which comes from arcing of motors, trolley wheels, broken bonds, defective contacts in automatic electric track systems, signals and the like lead to investigations and remedies which ultimately prove of advantage to the electric railway.

It appears that the tendency of radio listeners has been toward the use of more sensitive sets, and many have tried to increase the distance at which they can hear programs over their sets by using some form of "superhet," either factory made or of home construction. In many cases such attempts have resulted in an increased amount of noise and interference and the listeners have directed their attention to causes which appeal most naturally to them. That is, to the operating electric railway company in their vicinity.

Many railways now have specially organized departments where complaints are received, and where experienced men investigate the causes, then analyze and tabulate these for future use. The signal department of the United Electric Railways, Providence, R. I., now has this work on an organized basis. Complaints are received by letter, telephone, and through the radio department of other local utilities. Data obtained are put on a regular radio form. A number is assigned and the form is then forwarded to an inspector in charge of this department. Complaints are taken up in order and every method is used to locate and clear up the trouble. Out of 76 radio complaints investigated it was found that 40 per cent were due to leaking insulators and bare feed wires in trees, 25 per cent to leaking caps and cones, 20 per cent to trolley pick-up, 5 per cent to local lighting companies, and 10 per cent to owners' sets. It thus appears that interference caused by some defect on the company's system can be remedied without difficulty.

Buffalo Should Help, Not Hinder, Its Railway

REPORT has it that the Public Service Commission is about to use its good offices in an effort to effect an amicable settlement of the matters that have long been at issue between the city of Buffalo and the International Railway. This is indeed good news. It is perhaps true that the railway has not been without blame for the situation there, but its sins of omission and commission must at least be considered in the light of the uncompromising attitude of political forces which have been in control in Buffalo.

It has been necessary for the company at times to fight, and fight hard, but this attitude seems in large part, at least, to have been forced upon it by the city administration, aided and abetted by some of the local newspapers. The situation is best instanced by criticisms directed against the company by one of the local commentators for its stand with respect to increased fares, its insistence on the right to run one-man cars, and its opposition to making street improvements considered to be unduly burdensome.

There is nothing wrong *per se* in an application for an increase in fares. Perhaps the company has hewn too closely to the line of its rights and has not done all that is possible to win public interest in its needs. But the fare matter is an issue that ought to lend itself to settlement on the basis of the economic and financial factors that govern. As for the reference to the one-man cars, it is unfortunate for the critic to designate that vehicle as unpopular. The stand of the opponents of the railway rather than that of the railway itself is arbitrary on this matter, for the International is by no means alone in its advocacy of one-man operation. Hundreds of other companies have found it not only expedient, but a successful method of providing satisfactory transportation at minimum cost. In the matter of street improvement, which apparently involves the question of paving, the city of Buffalo should recognize that the tendency as indicated in five states and more than 60 cities has been more and more to apply car fares toward improved transportation service and not to paving city streets.

As indicated before, the company has perhaps not been altogether without blame, but its attitude with respect to the matters just reviewed and its indisposition calmly to sit by and contemplate the entrance of competition are not without justification from the standpoint of self-preservation, and also on the score that the things it seeks have led to the best results elsewhere, not only for the railway but for the community and its citizens. It is to be hoped that the practice of resorting to corporation baiting tactics in Buffalo is at an end, and that the company thus may soon be put on its mettle under circumstances and conditions that will permit it to function properly.

What One Industrial Operator Thinks About Transportation

USE of automobiles by industrial workers has been the subject of frequent discussion. Recently an industrial operator was commenting on this problem and in general decried the additional expense which factory workers were thus assuming, as being an unfortunate condition not to the liking of the management.

However, he saw a possible excuse in the local situation. This was the unsatisfactory service given by the street railway passing the factory. He said that the cars lacked the comfort, speed and general attractiveness to which the industrial worker as well as the balance of the riding public had been educated. When questioned further it appeared that the service and equipment offered was neither better nor worse than it had been for the past decade or more, but relatively it was far inferior to the present day conception of modern transportation.

Observation of the street railway system readily revealed the fact that it was about on a par with many other properties. The same kind of cars were in use on the same kind of track, maintained to about the same condition that prevails in three-quarters of the properties throughout the country. The same loading standards also were used and the cars upon arrival at the plant and when leaving at night had standing passengers whether ten cars or 30 were needed to provide the "service." Occasional complaints of overcrowding, lateness or bad ventilation were made, often to the industrial management, which in turn entered complaint to the car company. The impression was created that such complaints were only partially adjusted. The whole situation was summed up by the remark by this industrial operator that "If we attempted to run our business and offer as little service as the street railway we would be out of business in three months."

These remarks are a reflection not only against this particular railway but also to some extent against the whole industry. Often it has failed to recognize or respond to this general condition. True there has been serious financial embarrassment with which to contend, but the fact still remains that a large portion of operations are stabilized today. This same large portion is offering standardized service today as it was twenty years ago—but standard to what? Certainly not to conditions to-day. The industry is serving a new public. Just as the youth of today are fearlessly setting new standards of living that make the older generation often stand aghast, just so have the demands changed in transportation. If the people of today are to be sold, common carrier service must be produced on today's specification.

Worthy Prizes Encourage Valuable Suggestions

IN THE present era of prize awards can be heard a voice of the Roman past, "Give, I pray, rewards worthy of my ability." In answer thousands of dollars are awarded for artistic furniture designs, realistic short stories and convincing advertising slogans and posters. Nor have the utilities taken minor rôles in this movement. Prizes totaling $300 will be awarded every 60 days throughout the year by the Chicago, South Shore & South Bend Railroad for the successful efforts of employees in obtaining new business for the company. Another example is on the Chicago, North Shore & Milwaukee Railroad, where prizes ranging from $10 to $250 were awarded to 76 employees for securing new passenger and freight business. In Saginaw, Mich., citizens were recently awarded prizes by the utility there for the best essays on "The Value of Street Car and Bus Service." Again, in Buffalo the International Railway offered gold prizes in a competition for high school art students. It is expected that many of the designs submitted will be used in the cars of the system within the next few months. The Georgia Power Company has given prizes to its railway employees for essays on "What service do we owe the passenger for his fare?"

So the old order changeth. In the past, speaking broadly, prizes have been offered most frequently in safety contests. Now the employee is encouraged to use his imagination as well as his hands. May the prize contests fostered by the railway companies continue, with the managements amenable to honest suggestions and the patron and employee responsive to rare opportunities. Moreover, let the winners have prizes worthy of their ability.

Increasing Toll Among Street Workers

EMPHASIS is well directed that is placed on the hazards that attach to men engaged in work done by the electric railways in the streets. It is of course true, as a correspondent of the JOURNAL points out, that the subject has been touched upon many times in association work, but the problem seems to be how best to proceed to bring the matter to the attention of the public authorities and how to punish offenders who ignore barriers. Record could be piled upon record to show the seriousness of this matter, but the case of the Denver Tramway is typical of the experience of other companies. In that city, between February, 1923, and March 16, 1927, inclusive, seventeen men of the company were seriously injured, two of whom died as a result of being struck by automobiles while engaged in trackwork in the streets. Think of it! Really some of the instances of recklessness on the part of motorists that have been cited by representatives of various companies stagger one at the heedlessness of the average driver.

Men must on occasion work in the streets. There is no getting away from that. The devices which the companies have adopted for protection appear well nigh to have exhausted human ingenuity, but they are apparently of little avail. There is no need to cite them, but it is not amiss to say that frequently three or four men are employed to protect a similar number while at work, all because the average motorist is so heedless.

The problem is not alone that of the track department. It is the problem of every man connected with an electric railway anywhere. The managements are almost at their wits' ends over the matter, and any man anywhere who can advance a suggestion that will materially reduce the hazard to employees engaged in street work will do his fellow employee and humanity a real service.

It is, of course, important that adequate punishment be meted out to the driver who handles his machine recklessly, but that is second to the matter of devising preventive measures more efficacious than any that have yet been devised. Punishment after the offense, however, will not restore to usefulness a man who has been seriously injured, nor will it restore life to one who has been killed. As the JOURNAL has pointed out before, there is apparently no complete answer to the question, but the more the problem and its solution are discussed the more likely it is that the hazard will be diminished. The matter is, of course, complicated by the increasing multiplicity of machines and by the fact that more and more does the automobile come into the hands of the reckless, the incompetent and the financially irresponsible.

Just as Dead as If He Were Wrong

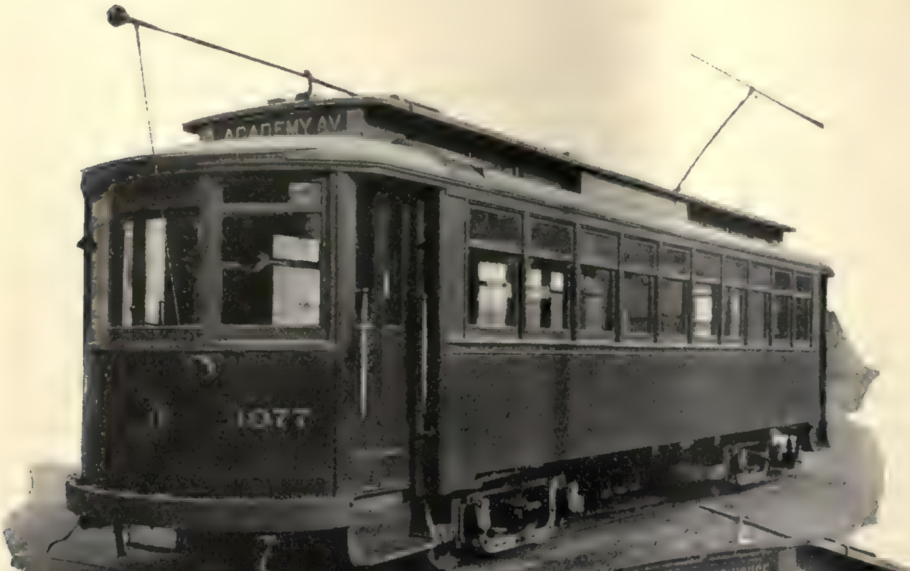
TO BE right is not enough. As a speaker at a recent meeting of electric railway men pointed out, it is not always wise for a public utility company to maintain its rights too vigorously. He referred to the man who "was right, dead right . . . but he's just as dead as if he were wrong." Of course it is important to be right, but being right, the company often can gain more by waiving its right than by insisting upon it.

If the time limit of a transfer has expired a street car conductor is technically right in refusing it. When the passenger has honestly misunderstood the restrictions on the use of a transfer, however, the railway would do better to accept it with a polite explanation of the rules than to refuse it and make a permanent enemy of the passenger. When some one boards the wrong car despite the conspicuous display of a correct destination sign it is the poorest kind of policy to chide him for his mistake or inquire rudely if he cannot read. Rather should it be the railway's endeavor to put him on the proper car to reach his objective.

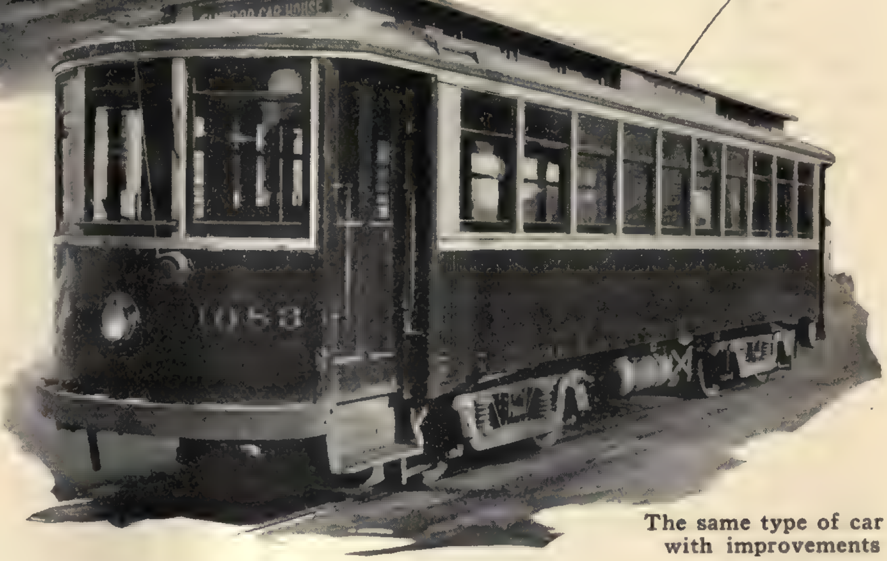
Multiplication of instances of this sort would be easy. Usually the company is actually right and the passenger in the wrong. To emphasize his mistake or "teach him a lesson" only antagonizes him. If this is the habitual attitude, the company soon earns the ill will of a large part of the public and eventually is likely to find himself just as dead as if it were wrong.

Good Service in Attractive Cars Increases Riding

By E. J. Dickson
Vice-President
United Electric Railways,
Providence, R. I.



Suburban car before rehabilitation



The same type of car with improvements

Passenger revenue of the United Electric Railways, Providence, R. I., increased 2.3 per cent from 1923 to 1926 despite extraordinary depression in business conditions and increased automobile registration of 46 per cent

PROPERLY to understand the results that have been obtained through the use of new and more attractive rolling stock on the lines of the United Electric Railways, Providence, R. I., it is necessary to consider several phases which have a direct bearing upon the results obtained. The railway operates practically all the electric car mileage in Rhode Island. During the five-year interval from 1920 to 1925 the population as shown by the federal and state census increased 74,863, or 12.39 per cent, an average of 2.48 per cent per annum. During the years 1923 to 1926 inclusive there was a gain in automobile registration of 45.79 per cent.

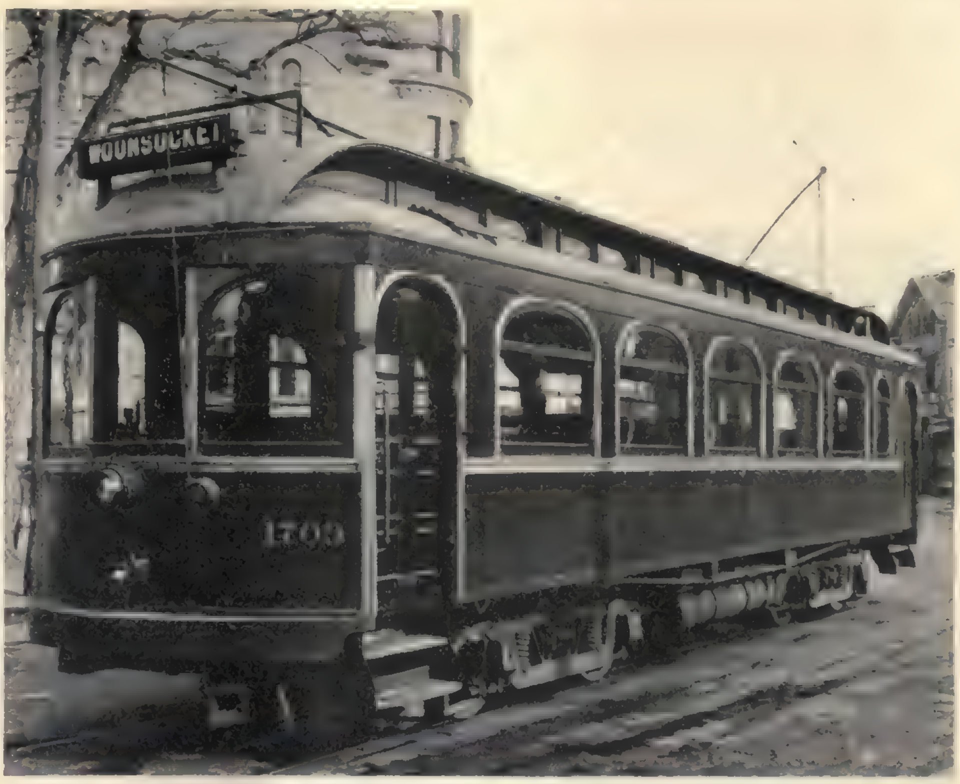
Most important in the state, considered commercially, financially, in size of plants and number of employees, is the textile industry. This alone gives normal employment to 85,000 wage earners. There are approximately 196,000 persons engaged industrially in the state, so that those employed in textiles constitute nearly half of the total. During the past four years the textile industry in New England has suffered an extraordinary depression. The intensity of that depression was most pronounced in 1926. Due to the large number of persons engaged in the textile industry, it is obvious that the barometer of business conditions fluctuates according to the state of business in textiles.

As this business suffered so extensively during the past four years, one might reasonably suppose that the electric railway revenues would decrease correspondingly. This was not the case, however, as is shown by the financial statements of the company, as follows:

Year	Gross Earnings
1923	$8,006,202.21
1924	8,179,822.41
1925	8,159,446.59
1926	8,193,345.17

The expansion in service and use of equipment to give greater convenience and comfort is shown by several changes which were made. The United Electric Railways instituted bus operation July 3, 1922, and has extended this operation to a very considerable extent up to the present. This service has been a contributing factor toward increasing gross receipts. In addition, on Jan. 1, 1924, and again on May 27, 1924, fares were increased and several zones were extended. This caused a considerable loss in traffic, but the revenue remained about stationary. Progressively since Dec. 31, 1922, the company has purchased 235 cars of the most modern city type, 210 of them being double-truck cars designed for one-man or two-man operation.

During 1926 the company instituted a program for improving the appearance of its equipment by the adoption of a more attractive color scheme. Cars are being painted to the new standard as they go through the shops for general overhauling. The company has also devised a plan for rehabilitating the best of its older equipment by improving interior and exterior decorations, illumination and seating. Some of the results achieved in connection with this program of improvements are indicated in the accompanying illustrations. Car 1703 is one of the high-speed interurban type used on the Providence-Woonsocket line. The original interior mahogany woodwork was refinished and the ceiling was painted a light cream. The seats, previously upholstered in plush, were recovered with Spanish grain leather. All cars on this line have been similarly rehabilitated.

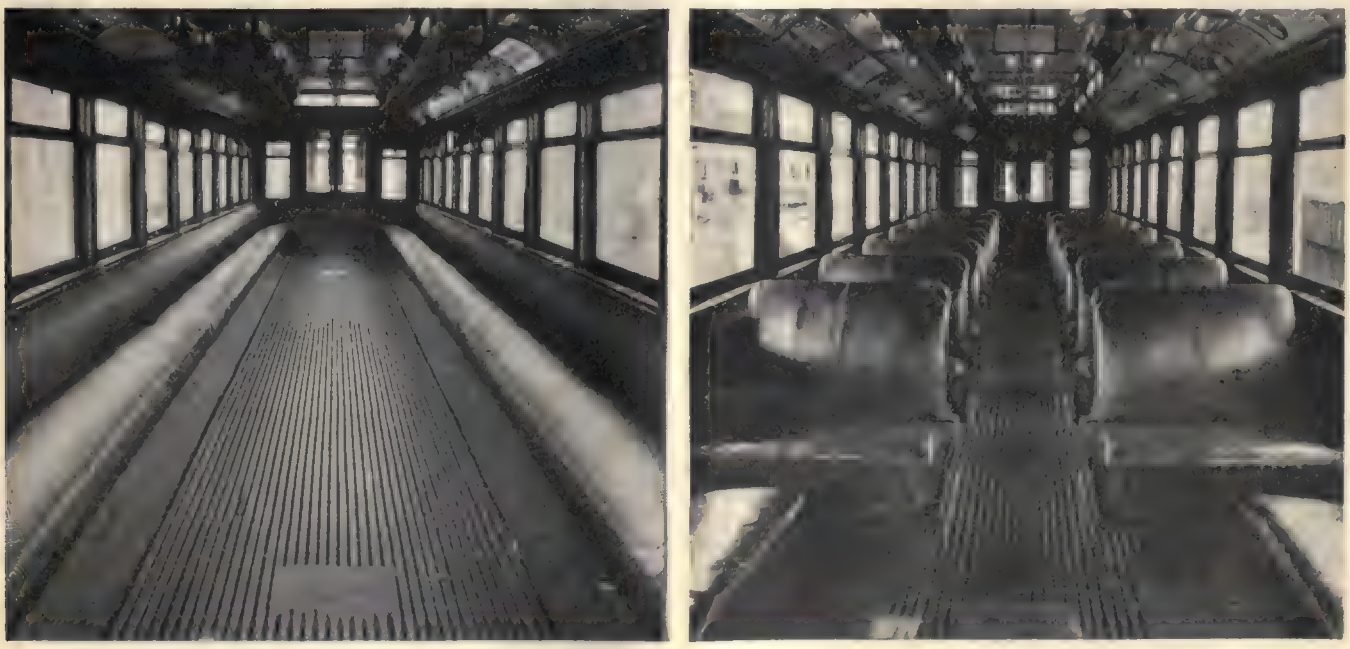


Exterior of one of the Providence-Woonsocket high-speed interurban cars after remodeling

Car 1083 is one operated on the East Greenwich suburban line. The improvements made in exterior appearance can be seen by comparing this with car 1057, with which it was originally identical. The interior of the remodeled car is provided with cushion leather seats. The ceiling is painted cream color and white enameled Rico handstraps have been installed. The interior woodwork also has been refinished and varnished.

Besides purchasing 235 new cars and rehabilitating many others, this railway has been engaged diligently in other respects during the past four years. Many miles of track have been rebuilt. Sections of double track have replaced single track and single-track sidings have been lengthened. Automatic signals and electric track switches have also been installed liberally.

The power supply of the railway has been improved radically so that it is now giving excellent results. Frequency and regularity of car service have been established to such an extent that favorable comment has been received both from patrons and from the local press. Material financial economies in cost of operation



At left—Interior of suburban car as originally equipped. At right—Improved interior after reconstruction have been effected in all departments of the company and each department has responded with better efficiency.

Referring to the question as to results which can be attributed directly to better appearing cars with greater conveniences and comforts, I do not hesitate to state that, notwithstanding all the other agencies employed to attract patronage, it is my firm conviction that had not the United Electric Railways undertaken the purchase of new cars, improved the appearance and convenience of others and strengthened its track facilities the gross earnings of the company would by no means be where they are today.

Interior of car No. 1703. Seats have been re-covered with Spanish grain leather

You cannot sell shabby material to self-respecting people in these days. Unless good service is provided in attractive and comfortable street cars the ordinary citizen will purchase his own vehicle, or use the one he may already possess, instead of suffering the inconvenience resulting from irregularity of service or the humiliation of riding in dilapidated equipment. I believe that profitable street car patronage can be had in any community where such facilities are provided and if good service is given in attractive cars. These factors have been most helpful in our situation.

Lexington Capitalizes Magnetic Brake

THE Kentucky Traction & Terminal Company, which operates the car lines in Lexington, Ky., on a 100 per cent one-man basis, has recently employed a novel method for advertising the air magnetic brake which is part of the equipment on its rolling stock. A signboard suspended from the roof of each car from one end to the other and on both sides carries a slogan featuring the braking equipment. Some of the outstanding slogans are: "World's First Air-Magnetic Brake Car," "America's Model Railway—Air-Magnetic Brake," "Ride Electrically—Stop Magnetically," "Magnetic Brakes—Our Original Development," "Your Guard to Safety—America's First Combination Brakes."

Make Your Experience Pay Dividends
See the Maintenance Competition announcement on page 1006

Pressure Shower Bath Speeds Up Car Washing

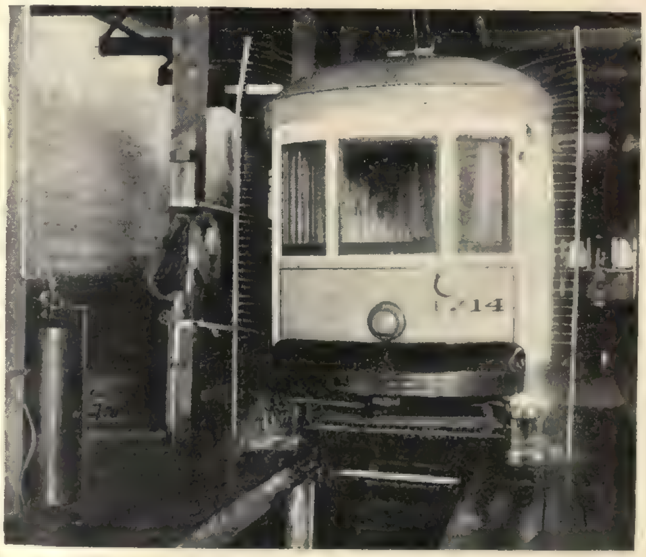
CAR-WASHING time has been cut in two at the Grand Avenue shops of the Connecticut Company, New Haven, as a result of the use of a pressure shower bath. The advantages of this method of cleaning the car exteriors was recognized some time ago, but it was found impossible to secure sufficient pressure from the city water mains to do the job properly. To overcome this difficulty J. E. Dooley, master mechanic, has devised apparatus whereby the shop compressed air system is used to force water through perforated pipes against the sides of the car.

A car air tank has been installed in a vertical position alongside the washing track. This is connected through a check valve to the city water supply. Outlet is provided through a second valve to two vertical 1-in. pipes, one on each side of the track. These pipes have $\frac{3}{32}$-in. holes spaced 3 in. apart. At the top they have been bent inward to direct the water onto the car roof.

Shop air is admitted into the top of the tank at about 80 lb. per square inch pressure. The check valve in the water feed line prevents water being forced back into the main. Thus the whole contents of the tank, about 41 gal., is driven out through the openings in the pipes.

This quantity of water is sufficient to spray a car twice. The first spraying wets down the sides and roof. Car cleaners then scrub them down with a cleaning mixture, using long-handled brushes. After that the car is run through the shower a second time for rinsing. A bleed valve in the tank releases the air and allows it to refill with water, a process requiring about 60 seconds. During this time the washed car is being taken away and a dirty car brought up.

Two men constitute a crew for this work. One runs the car while the other operates the shower. Each brushes down one side of the car.



Washing car in Connecticut Company shops

Compressed air admitted into the top of the tank at the left forces air out through perforated pipes against the side of the car.

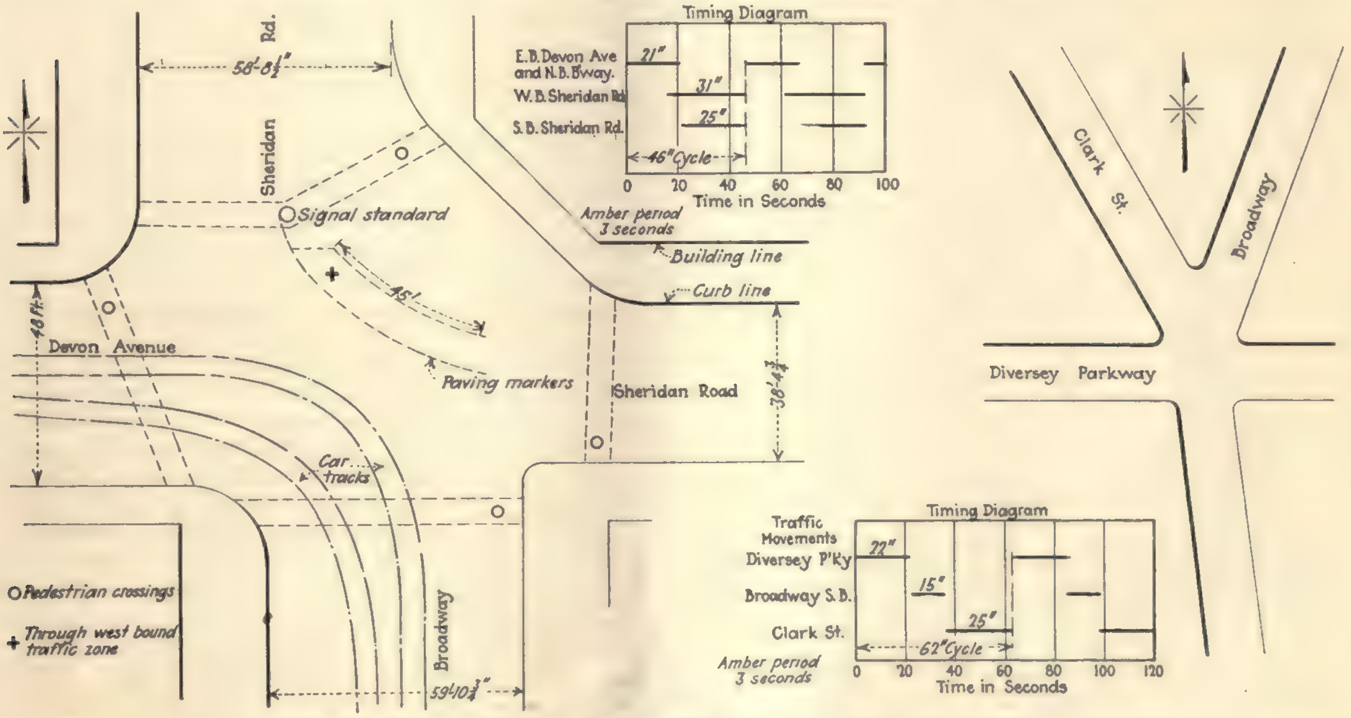
Washing the roof every time the sides are washed has proved to be good policy. This prevents the accumulation of dirt that may later run down the sides during a rain storm, giving the car a streaked appearance.

Traffic Signals Fitted to Complicated Intersections

Special methods of signal control are employed at complicated crossings in Chicago to increase flexibility of traffic movements, reduce interference and cut delay at intersections

By L. M. Traiser
Special Traffic Engineer Chicago Surface Lines

REGULATION of traffic is in principal demand where streets cross or intersect. These intersections are indispensable, but under heavy traffic conditions they become points of obstruction to traffic flow. Consequently, some form of regulation and control becomes necessary to give ease and safety of movement with minimum delay. This can only be accomplished by considering all of the factors in each situation and designing the control system to meet the specific set of conditions encountered. The growing inadequacy of city streets to handle the traffic volume which continues to increase at a rapid rate makes it necessary to adopt every available means of expediting the movement of vehicles over the principal lanes of travel. The principle of the greatest good to the greatest number must govern traffic control under such conditions even though it becomes necessary to restrict less important movements and to eliminate certain conveniences that were permitted under less congested conditions. Elimination of cab stands and vehicle parking near heavy traffic intersections is often a necessary step. Left turns should also be prohibited when they add confusion out of proportion with the convenience which their retention affords.



Special methods of handling traffic at complicated intersections

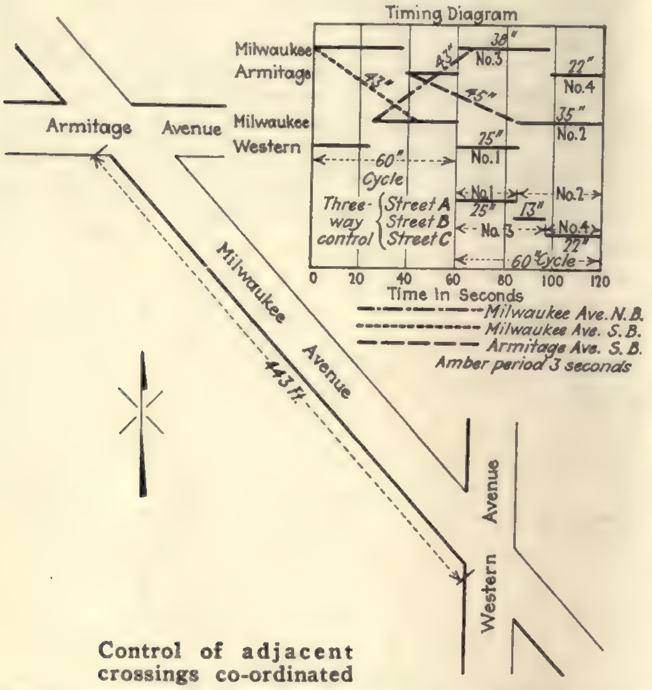
At the left—Traffic control arrangement designed to meet special conditions encountered at Devon Avenue, Sheridan Road and Broadway intersection in Chicago. Half the southbound traffic makes a west turn and 90 per cent of westbound vehicles turn right. The special method adopted to move this traffic is explained in the text of the article.

At the right—Intersection of Broadway, Clark Street and Diversey Parkway in Chicago. Both Broadway and Clark Street carry car lines and heavy vehicular traffic. Diversey Parkway is a heavily traveled boulevard. The scheduled sequence of the signal cycles used here is all-important to cutting down interference and delay.

To render these intersections most serviceable, enforced traffic restrictions must be combined with a method of control that will provide ease of movement with minimum time waste. Control by a traffic officer may be superior to mechanical control if the officer appreciates the time saving which results from short traffic change intervals and can give his full attention to this work. However, custom requires that traffic officers answer questions and enforce regulations. These demands, coupled with the common tendency to give long movements and wait for vehicles approaching the intersection widely spaced, decrease seriously the efficiency of manual control. Greater flexibility, less conflict of vehicles and a smaller time waste can be obtained with mechanical control at many intersections than would be possible under manual operation. This is particularly true at some of the complicated intersections encountered in a large city, which in the case of Chicago run through a wide range of conditions. Some of the special control installations now used or proposed in Chicago are designed for the following situations: Two or three streets intersecting at one point; closely related intersections on a heavy traffic street; three streets intersecting within close range but not at a common point.

SPECIAL CONTROL FOR UNUSUAL CONDITIONS

When two or more streets intersect at a common point and when the traffic arriving is not influenced by any near-by control system, the problem is one of giving proper consideration to traffic volumes on each street, the street widths and the prevailing directions in which the traffic must be moved through the intersections. This must be done in a manner to expedite the major traffic streams. Time must also be allotted in the control system to permit the movement of the minor traffic in a manner to give the greatest possible efficiency to the intersection.



Control of adjacent crossings co-ordinated

The intersections of Armitage Avenue and Western Avenue with Milwaukee Avenue in Chicago furnish an example of the interconnection of closely related crossings. The movement of street cars on all three streets controls the speed of the traffic stream due to the narrow streets and parked cars.

At certain intersections the predominating movements suggest a departure from the usual method of permitting traffic to flow in both directions at the same time on a given street. Such was the case in Chicago at the intersection of Broadway, Devon Avenue and Sheridan Road. An accompanying illustration shows a diagram of this intersection, the widening of which will be completed this summer. Here the two principal movements arrive southbound and westbound on Sheridan Road. Approximately half of the southbound traffic makes a left turn, while more than 90 per cent of the westbound vehicles make a right turn. The desirability of permitting these two streams to move simultaneously is supported by the ease with which the two remaining movements are combined. Twenty-five per cent of the northbound Broadway traffic, including street cars, turn left at this intersection, while essentially the only demand of eastbound traffic is for a right turn.

With the widening out of the northeast corner ample space will be made available for a through westbound traffic zone to be located as shown in the drawing. Vehicles will accumulate in this zone while Sheridan Road movements are running and will continue west with northbound left turns from Broadway. Such minor movements as left turns both east and west and through movement eastbound are prohibited. The intersection is so located that these restrictions cause very little inconvenience. A time cycle of 46 seconds for this location was determined by the 2¼-mile progressive signal system on North Broadway as part of which this intersection will operate.

CONTROLLING A THREE-STREET INTERSECTION

Another special control which falls under this classification is at Clark Street, Broadway and Diversey Parkway. This is a three-street intersection at which Broadway terminates. Here both north and south streets carry car lines in addition to heavy vehicular traffic. Diversey Parkway is a boulevard. A drawing of this intersection is shown in an accompanying illustration.

Under manual control two movements were given to traffic at this intersection, one for Diversey Parkway and the other for both Clark Street and Broadway. With this arrangement traffic southbound on Broadway conflicted, first, with vehicles northbound on Clark Street and then forced its way in with traffic southbound on Clark Street. Much delay arose from this interference.

With mechanical control and shorter intervals it was necessary to eliminate the conflict. This was done by using three-way control equipment timed as shown in the illustration. Here the scheduled sequence of the signal movements is all-important in cutting down interference and delay of the traffic streams. Starting with a 22-second movement on Diversey Parkway, followed by a fifteen-second period for southbound Broadway, the cycle is completed with a 25-second movement in both directions on Clark Street. By following Diversey Parkway, the short period allotted to southbound Broadway traffic permits faster speed and assures greater freedom from interruptions than if it were preceded by Clark Street, where northbound vehicles moving at a slower speed and passing the south side of the intersection during the amber period might frequently delay the Broadway traffic a large portion of the fifteen seconds allotted. Regulations prohibiting left turns to and from Diversey Parkway and eliminating parking on Clark Street from Diversey Parkway to Dole Street, one block south, were established while the intersection was under manual control and are continued at present.

This special method of control has eliminated all conflicting movements and permits much faster speed over the intersection than was formerly possible. A notable improvement over manual control has been observed.

When an important thoroughfare is intersected by streets only a few hundred feet apart and when traffic at these intersections warrants mechanical control much time waste may result if the controls are operated independently. Such conditions are found often on diagonal streets which frequently carry important car lines and much vehicular traffic. Generally, interconnection of control can be employed to advantage where the intersections are sufficiently closely related and where distances and intervening conditions permit a consistent running time for the traffic between intersections.

In Chicago eight such combinations are now in service. Mechanical control equipment operating two or three intersections on car line streets and boulevards has brought about a considerable time saving and a more uniform movement of vehicles. On Milwaukee Avenue there are two such groups, one of which is explained below.

Milwaukee Avenue, an important business and car line street, is crossed by Western Avenue running north and south and again within 500 ft. by Armitage Avenue, an east and west street. In this group of crossings heavy through traffic on Milwaukee Avenue demands first consideration. The intersecting car line streets, particularly Western Avenue, require a fair allotment of time to accommodate a moderately heavy cross traffic. Between these intersections the average running time of street cars was found to be 43 seconds in both directions on Milwaukee Avenue and 45 seconds for Armitage Avenue cars turning south on Milwaukee Avenue.

Here street cars control the speed of the traffic stream due to the frequency of car movements and the narrow roadway on which parking is permitted. Observations of running time include the period required to transfer passengers at the outgoing intersection. That is, the observation begins when the car leaves the first intersection and is concluded when it is ready to leave the second intersection.

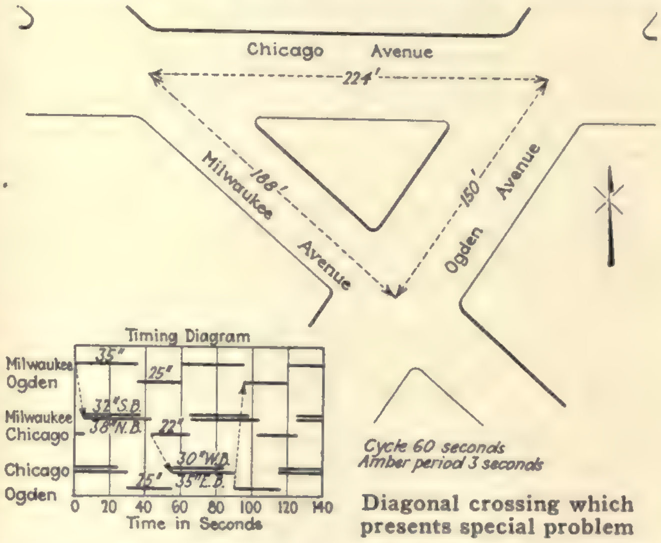
Applying this running time to the graphical timing diagram shown in another illustration it is found that southbound Milwaukee Avenue cars starting at the beginning of the movement at Armitage Avenue are ready to leave near the middle of the Milwaukee Avenue movement at Western Avenue. If this 43-second running time is now applied to a car northbound on Milwaukee Avenue starting with the "Go" signal at Western Avenue, the car will be ready to leave at Armitage Avenue eight seconds after the northbound movement starts. The graph also shows the movement for a branch of the Armitage Avenue car line which makes a right turn from east to south and continues down Milwaukee Avenue.

In this installation the intersections are timed to meet the individual needs of the various traffic streams and yet so related that movement at one intersection is given at the proper time to receive a wave of traffic from the other. An interesting feature of this installation came in the use of the common three-way control equipment to give this progressive movement. As shown in the graph this was accomplished by timing the controller 25 seconds on "A" street, thirteen seconds on "B" street and 22 seconds on "C" street and then making electrical connections to give movements at both intersections as shown. It should be noted here that the instant of change of traffic flow at one intersection need not coincide with the change at any other. Completely flexible control apparatus is usually necessary to permit such a fortunate combination of traffic flow. This arrangement, which is one of two such groups on Milwaukee Avenue, has controlled these intersections with notable smoothness for some months.

THREE ADJACENT BUT NOT COMMON STREET INTERSECTIONS CONTROLLED

Small islands are sometimes formed by three streets which intersect within a few hundred feet of a common point. When only two of these intersections need mechanical control the method just described may be used to advantage, but when heavy traffic requires mechanical control at all three crossings, interconnection with proper timing permits a freedom of movement impossible with separate controls.

When a distance less than 300 ft. separates these intersections, the resulting small reservoir capacity between crossings practically demands mechanical control of a type which will prevent accumulation between the crossings greater than the street space will handle. In a situation of this kind the signal changes will be governed chiefly by the traffic volumes to be accommodated at each intersection and the running time and temporary storage capacity between intersections.



Diagonal crossing which presents special problem

Still another traffic control situation is represented by this set of crossings in Chicago. Although the three crossings are adjacent, they are not common, and require the signal control to be worked out to meet the conditions encountered.

An example under this classification is the control soon to be installed at Chicago, Milwaukee and Ogden Avenues. At this location the first two streets carry important car lines and heavy vehicular traffic. Ogden Avenue is a boulevard. An accompanying illustration shows the arrangement of the intersections and a graphical timing diagram of the signal system.

Traffic on Milwaukee Avenue requires the largest time allotment, while Chicago Avenue follows next in importance. Small street space between intersections on Milwaukee Avenue northbound, Ogden Avenue southbound and to a lesser degree on Chicago Avenue eastbound makes necessary movements at the outgoing intersection on each street of sufficient length and so timed with respect to the incoming intersection that these small reservoirs will be emptied after each movement.

The graphical timing diagram shows how this was accomplished. A 35-second movement northbound on Milwaukee Avenue at Ogden Avenue is given a 38-second clear period, starting five seconds later at Chicago Avenue. An eastbound Chicago Avenue movement of 22 seconds at Milwaukee Avenue is given 35 seconds, starting twelve seconds later to clear at Ogden Avenue. Ogden Avenue flow at both intersections is of 25 seconds duration, but a five-second advantage is given the southbound movement at the outgoing intersection to prevent backing up of traffic which would interfere with Chicago Avenue.

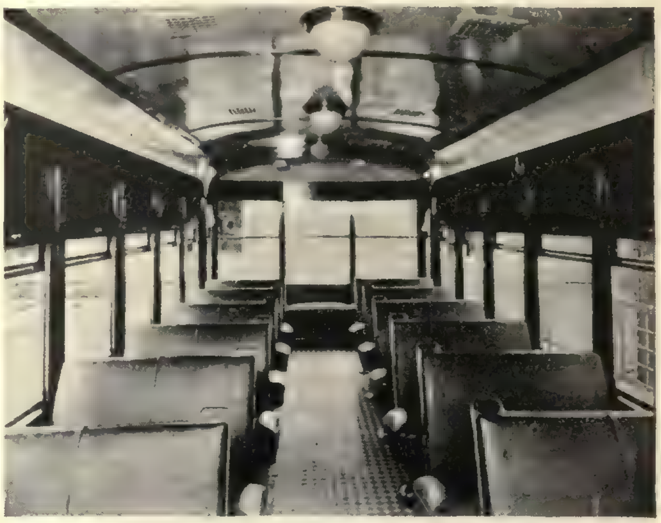
The other movements can readily be taken from the diagram. To prevent overloading of the reservoirs on the island side of the streets, the control on Milwaukee Avenue at Chicago Avenue and Chicago Avenue at Ogden Avenue must govern each direction separately. Therefore, where this flexibility is given in the timing diagram movements in each direction are shown independently. Proper vehicle flow is obtained by separate connection of lights on the two sides of certain of the signal standards. This measure of flexibility offered by mechanical signal control can be used to advantage at many intersections. Even though the control equipment required to give this flexibility is often costly, the time saving obtained is frequently worth many times the expenditure.

The Chicago, Milwaukee, Ogden Avenue group of specially controlled crossings is one of four such combinations in Chicago varying in distance between intersections up to 1,170 ft., where properly connected mechanical control has made possible conspicuous time saving and a more uniform traffic movement. The special methods of control mentioned or described here were developed for the city of Chicago by the Chicago Surface Lines.

New Cars for Jamestown Street Railway

Eight New One-Man de Luxe Safety Cars Purchased—Attractive New Color Scheme Adopted—No Expense Spared in Making These Cars the Latest in Car Construction

FULL realization of the importance of modernization of equipment to obtain increased patronage and reduced maintenance expenses caused the Jamestown Street Railway, Jamestown, N. Y., to purchase eight new one-man de luxe safety cars for city operation. It is anticipated that the attractiveness of these cars, together with the high class of service they will render, will result in a marked increase in revenue.

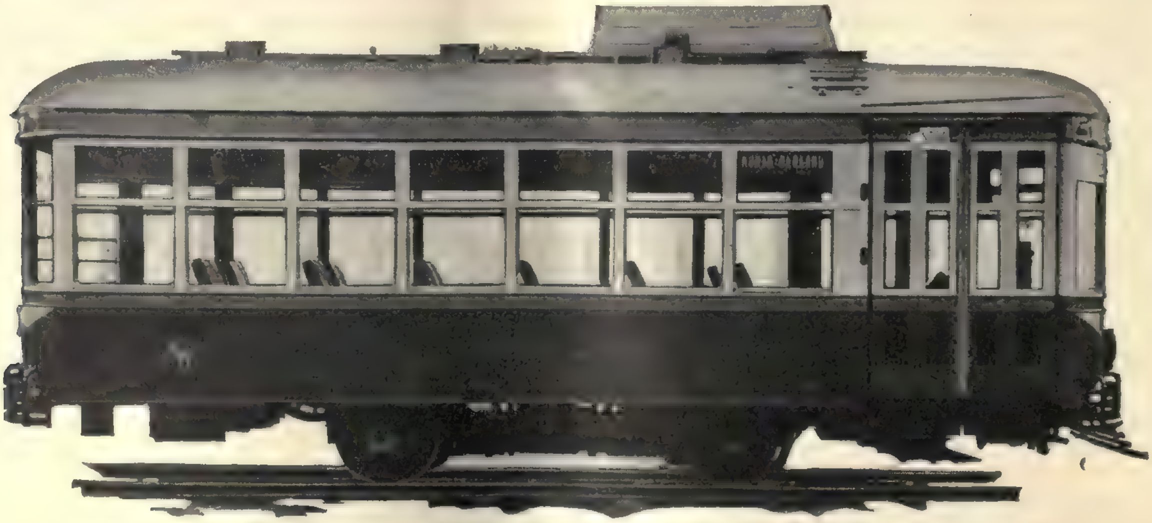


The arch roof, center-dome lighting, Spanish leather seats, and inlaid rubber tiling floor covering create a pleasing interior in the Jamestown cars

These cars, with their convex sides, round ends, arch roof and generally pleasing appearance, are expected to receive the unqualified approval of the public. Many new features are incorporated, one of which is the harmonizing color scheme. This consists of a pyramid gray body with a blue belt rail, desert sand letterboard and cream sash, all being blocked off by a horizontal black stripe. This combination of colors, together with the gray roof and black trucks, gives a pleasing appearance.

The cars were built by the St. Louis Car Company, St. Louis, Mo. Mahogany interior finish with white veneer headlining and gray trim afford a cheerful and restful effect. The broad, heavy upholstered welted seam seats with deep spring cushions and padded backs are covered with genuine Spanish leather, providing comfortable riding space for two persons. The cars have twelve stationary cross seats for two passengers each, one stationary longitudinal seat for one passenger, and a continuous seat across the rear end. Thirty passengers can be seated comfortably. Ample knee room is provided by the spacing of the seats at 31-in. centers.

The floors are covered with inlaid rubber tiling, giv-



One-man-operated de luxe safety cars purchased by Jamestown Street Railway

EQUIPMENT USED ON NEW JAMESTOWN CARS

Type of car	Passenger safety, single truck	Car trimmings	Bronze	Lightning arresters	Westinghouse type K3
Seating capacity	30	Compressors	Westinghouse DH-16	Motors	Two 265A, inside hung
Weight, total	19,000	Conduits and junction boxes	Duraduct	Paint	Johnston
Length over all	27 ft. 7 in.	Control	K-63G	Safety devices	Safety Car Devices Co.
Truck wheelbase	8 ft. 6 in.	Curtain fixtures	Curtain Supply Co.	Sanders	two front, one rear
Width over all	8 ft. 8½ in.	Curtain material	Pantasote	Sash fixtures	"Rex" brass
Height, rail to trolley base	11 ft. 11 in.	Destination signs	Hunter	Seating material	Spanish leather
Body	Semi-steel and Plymetl	Door operating mechanism	Natl. Pneumatic	Slack adjuster	Gould
Interior trim	Mahogany	Energy-saving device	Economy meters	Springs	St. Louis Car Co.
Headlining	Veneer	Fare boxes	Johnson	Step treads	Kass
Roof	Arch	Fenders	HB lifeguards	Trolley catchers	O.B.
Air brakes	Westinghouse	Gears and pinions	General Electric	Trolley base	U. S. 20-A
Axles	4 in. heat treated	Hand brakes	Peacock	Trucks	St. Louis No. 7
Bumpers	Four bar spring steel	Headlights	Golden Glow..SM95	Ventilators	Peerless
Car signal system	Faraday	Journal boxes	St. Louis Car Co.	Wheels	Steel, 26 in.

ing a safe and comfortable footing for the passengers. Its colors blend softy into those of the car interior. This tiling also acts as a sound absorber to deaden truck noises. Six Peerless ventilators installed on the roof, three on either side, are fitted with grille and register. The cars are heated with individual double-coil truss plank heaters and the temperature is regulated by thermostatic control. One cab heater is also installed for the comfort of the operator and is supplied with a separate control.

Practically every type of safety device has been incorporated in these cars, including an emergency exit door on the left side at the extreme rear. Large folding selectively controlled air-operated doors permit of easy and unobstructed entrance and exit. When the door is open a stop sign attached to the exit door acts as a warning to approaching vehicles that passengers are alighting. The cars are provided with brilliant interior illumination, there being three Brascolite two-lamp dome fixtures on the ceiling, two rear platform lights, and two door lights, besides the usual farebox, sign, tail and head lamps. As an added feature, a stop light on the rear dash shows red when the air brakes are applied. Motor rheostats, usually installed beneath the car floor, are installed upon the roof. Suitable metallic covering permits of proper ventilation and prevents entrance of rain and snow.

All platform control apparatus is inclosed in mahogany cabinets, creating a neat and clean platform appearance. The large section plate-glass windows in the vestibule assure an unobstructed view at all times. The seven large windows on the right side of the car and the nine on the left side, with cross-bar window guards, provide a clear, unobstructed vision without danger of injury from passing cars.

A decided departure from the usual method of numbering has been adopted. Each car is named after an Indian chief whose name began with the letter "C." The names decided upon were Chautauqua, Chadakoin, Conewango, Chippewa, Cayuga, Cattaraugus, Cassadaga and Canadohta.

Some of the principal dimensions and data on the eight new cars are shown in the accompanying table.

Enviable Service Records in New York State

NEW YORK STATE RAILWAYS, Rochester lines, boast a total of 321 employees with 25 years or more of service. The oldest employee in point of service is Joseph W. Hicks, assistant to the president, with 60 years to his credit. Next in line comes his brother, Thomas, with 48 years. Third in rank is Dominic Rick, a workman with the railways for 45 years. Two motormen, James A. Behan and John Lynch, have been piloting cars in Rochester for 40 years. W. J. Whalen and Cole R. McCracken lead the list of conductors with 36 years of service each. In the executive class there's Donn Byrne, assistant treasurer, 42 years on the payroll; Benjamin C. Amesbury, superintendent of transportation, 37 years; F. D. Livernash, division superintendent, 37 years, and Bert E. Wilson, general passenger agent, who has chalked up 35 years.

Store Check at South Bend Shows Popularity of Railway

OUT of 25,863 customers checked at five leading stores at South Bend, Ind., on Saturday, March 19, 16,479, or 63.8 per cent, used public transportation vehicles. Those who came by street car represented 56.2 per cent of the total, while those coming by interurban and bus were 2.1 and 5.5 per cent respectively. Automobile users were 19.4 per cent and walkers 13.6 per cent. Figures showing by two-hour periods the number of users of each type of transportation are given in the accompanying table.

MEANS OF TRANSPORTATION USED BY SOUTH BEND STORE CUSTOMERS

Hours	Street Cars	Int. Cars	Bus	Auto	Walk	Bicycles	Buggy	Taxicab	Skates	Motor-cycles	No Reply	Total
9-11 a.m.	1,762	40	184	281	304	2	1	...	..	..	56	2,630
11 a.m.-1 p.m.	2,695	79	290	548	600	4	4	...	..	..	114	4,534
1-3 p.m.	2,912	133	333	1,305	772	9	2	1	1	..	207	5,676
3-5 p.m.	4,249	199	337	1,927	1,252	7	5	1	2	2	290	8,271
5-7 p.m.	2,908	88	270	966	591	1	1	...	..	..	127	4,952
Total...	14,526	539	1,414	5,027	3,519	23	14	2	3	2	794	25,863
Per cent	56.2	2.1	5.5	19.4	13.6	..	..	0.1	..	..	3.1	100

High school girls wearing orange ribbons with the inscription "C., S. B. & N. I. Ry. C." were stationed at the store doors to make this check. As each customer entered, inquiry was made concerning the means of transportation used in reaching the store. This information was noted on a slip, which was then deposited in a box provided for the purpose.

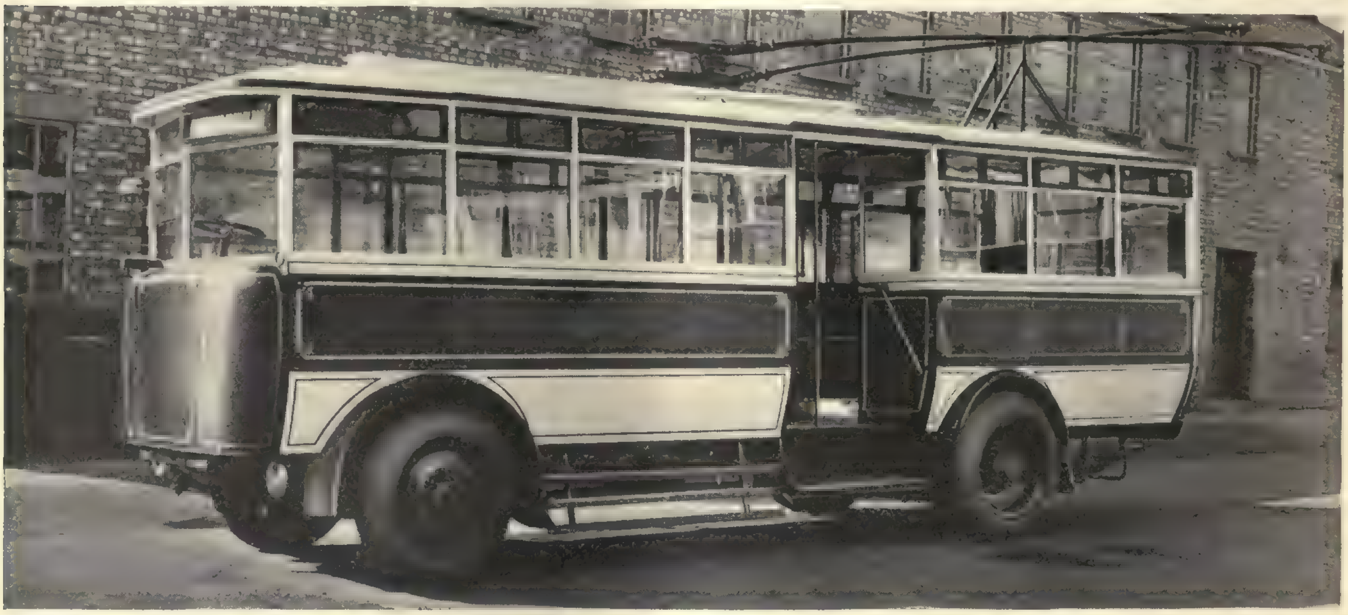
Some skepticism was felt by the railway management about the wisdom of making the count on a Saturday. It was feared that the proportion of car riders might be rather small because those who stopped work at noon could go home, get out the automobile and take the whole family down town shopping. The results shown by the check were extremely gratifying to the management, although it was felt that a week day would have shown an even larger per cent of railway passengers.

Since the count was made the company has noted a considerable number of expressions of surprise from merchants and the general public at the large proportion of customers found to be using street cars to reach the stores.

Trackless Trolley Equipped with Pneumatic Tires

DEMONSTRATION of a trackless trolley equipped with large pneumatic tires was recently made before a group of transportation officials in Ipswich, England. The new vehicle received the approval of those present. Features of the vehicle are:

1. Pneumatic tires on all wheels—38-in. x 7-in. single at the front and 38-in. x 7-in. twin at the rear.
2. Springs, specially long and designed to secure easy riding both with the vehicle light and in an overloaded condition, and to meet all conditions of road surface.
3. Body arranged with two compartments, between which is a wide central entrance for passengers with a low loading step. The floor of the vestibule is only 2 ft. 4 in. from the ground level.
4. Seats of the semi-bucket type, luxuriously upholstered in real leather.
5. Improved lighting arrangements in the form of bulkhead-type fittings having powerful electric lamps connected with the main driving circuit.



Center-door trackless trolley recently developed in England

The chassis has the driving motor fixed within the frame in a position about midway between the front and the rear axles. The driving motor is of the inclosed-ventilated, series-wound traction type, with interpoles, developing 50 hp. on the standard rating of the British Electrical Standards Association specification for traction motors, and is capable of carrying an overload of 100 per cent for short periods.

The controller, which has been improved in many details, has a foot-gear for operating the main drum, while the reversing drum, which is mechanically interlocked with the main drum, is operated by a lever at the right of the driver. The main drum is arranged to give five series notches and one field shunting notch.

Power developed by the motor is transmitted to the back axle by a floating tubular propeller shaft of special steel, provided with inclosed universal joints at each end, the couplings of these joints, where attached to the motor shaft and to the worm shaft on the back axle, being provided with splines.

The back axle is forged from a steel billet, and is of the basin type for receiving the differential gear. The reduction in speed from the motor shaft to the driving axle is obtained by a specially heavy type of worm gear. At each end of this back axle a massive cast steel bracket is mounted, which carries the extra large brakeshoes and their cams.

Each driving wheel is fitted with two independent internal expanding brakes acting on large diameter drums, One brake is applied by a hand lever of the ratchet pattern, the other is applied by a pedal. Each brake is of sufficient power independently to stop the vehicle under all conditions.

All bearings throughout the vehicle are of the roller type, including those in the motor. With the exception of the worm and differential gear in the back axle, which are lubricated by oil, all other parts where lubrication is required are arranged for grease, nipples being provided at each point for use with a grease gun.

The body, built throughout by Ransomes, Sims & Jefferies, Ltd., has a wide central entrance with a compartment on each side of the vestibule. The front compartment accommodates fourteen passengers and the rear saloon seventeen passengers. There is also a comfortable seat for three passengers on the offside of the vestibule. The backs of the back rests are covered with carpet, which lends a cosy appearance to the interior. The steps to the central entrance are low, and the floor of the vestibule is only 2 ft. 4 in. from the ground level.

English oak and ash, naturally seasoned, are used in the construction of the body. The outer panels are of silver steel. The exterior of the vehicle is painted in artistic style and the interior is tastefully upholstered and decorated. The interior panels are embossed to match the leather of the upholstery, and the moldings are French-polished of a rich mahogany shade. The white enameled ceiling with its polished handrails and copper-oxidized lamps and fittings makes a very light finish.

Four roof ventilators are installed and the upper sash of the main side windows are hinged in a vertical plane, opening either forward to induce a current of fresh air, or rearward in order to extract heated air from the interior of the vehicle. Two main side windows in each saloon are arranged to drop.

Schedule Making and Checking

in Los Angeles

The methods used by the Los Angeles Railway follow somewhat unusual lines. The method of procedure from the traffic check to the finished schedule is discussed

SCHEDULES used by the Los Angeles Railway follow the general form of listing car and crew runs, but for many years the practice has been to typewrite the schedules rather than to have them drafted by hand. The upper part of a typical week-day schedule is reproduced. As will be seen, the car schedule is at the left, and shows in separate horizontal divisions the schedules of each car from the time it leaves the carhouse until it returns. The car schedule is broken up into "pieces," as operated by the different crews, each piece being marked with the crew number. In addition there is a condensed guide of work runs at the right side of the sheet, showing the time on and time off for each piece of work for each car.

TRAIN RUN NUMBER KEYED TO SCHEDULE

Information from which schedules are made up is obtained by traffic checks. The schedule department has a corps of ten traffic checkers experienced in this work riding the cars at all times. This plan has supplanted the earlier method of having conductors make traffic counts. To insure reliable counts by the checkers, they in turn are checked by department men who ride the cars.

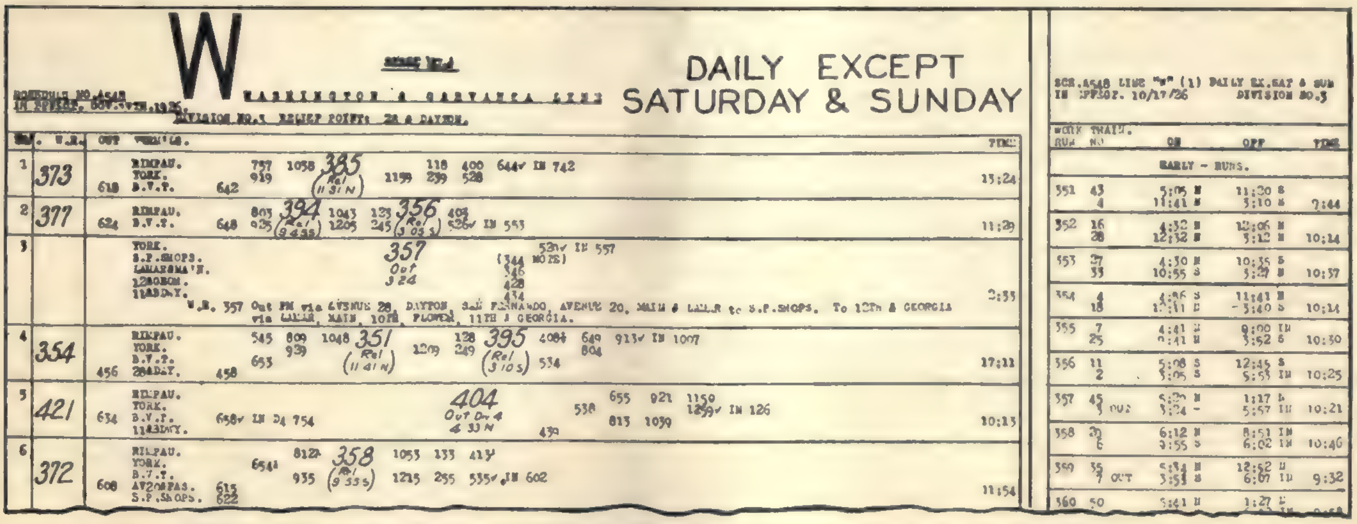
Traffic counts are made on the various lines at points of peak traffic, covering headway and passengers carried. The checker tabulates the car number, train number, destination, passengers and time at which the car passed the checking point. It is upon this information that the revised headway is based.

When these forms reach the office, lines are drawn through the tabulation indicating twenty-minute periods. A summary is then made on a tabulation sheet, giving the total number of passengers carried through a traffic checking point in consecutive twenty-minute intervals, throughout the eighteen hours from 6 a.m. until midnight. This summary is posted on a tabulation sheet. From the tabulation a chart is drawn showing the number of passengers by twenty-minute periods. This assists materially in visualizing conditions on a particular line.

Heavy loads are immediately noticed on this tabulation and chart. With a predetermined standard of service established, it is possible to determine by reference to an arbitrary table just what number of cars should be run in a twenty-minute period to handle the load. If the number of cars as calculated is greater than the number indicated in the table, a revision in schedule is made to improve the service. Traffic checks are continually being made, as the seasonal riding habits of the public require changes in schedule to make the service economical.

Before a change is made in a schedule, however, the running time is checked to determine a proper normal running time upon which the revised schedule may be based. Checkers with experience in operating cars are used in this work. They note the way the motorman handles the car and indicate on their reports the speed of the car between time points. From fifteen to 25 rides are made through a time point before establishing a new running time. After the time for these rides has been averaged, an allowance of 30 seconds is made to give what is known as a normal running time.

Having established a normal running time between time points and between terminals, a schedule is set up based upon the headway as determined by the traffic



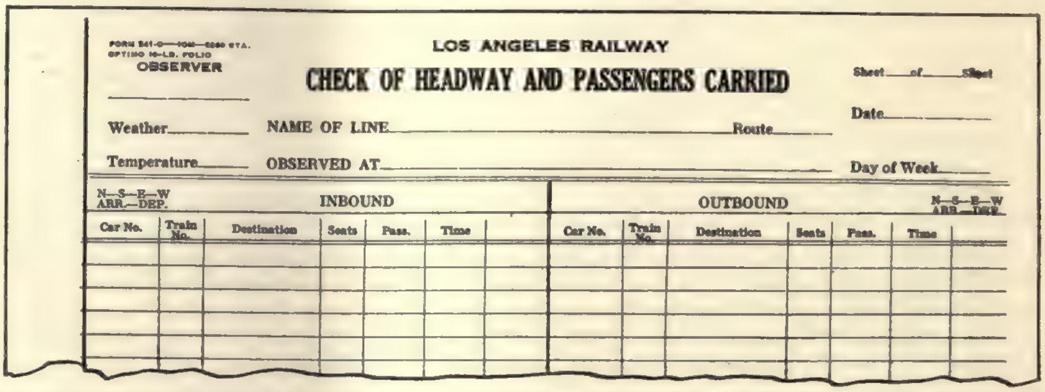
W

DAILY EXCEPT SATURDAY & SUNDAY

EARLY - RUNS.

Schedules used by the Los Angeles Railway are based upon the train number and are typewritten. The work runs are listed at the left check. A layout of such a schedule with the proper headway is made on a large sheet, listing across the sheet the time points for a complete round trip of the car, taking into consideration the layover periods. From this sheet a consolidated time sheet is compiled on which is set up the time of all runs of a particular car or train from the time it leaves in the morning until it is returned to the carhouse at night. This sheet is a feature of the work of the Los Angeles Railway schedule department. It simplifies to a considerable extent the subdividing of work in order to establish work runs for trainmen that will give approximately the same amount of working time. On this sheet the clerk checks off a portion of the runs of the car, indicating that he has

Checkers at load points on the line make eighteen-hour surveys of all cars passing the point and, on the form shown at the top, they indicate the car number, train number, destination, passengers on car and the time car passed the point of checking. This tabulation is sent to schedule department office.

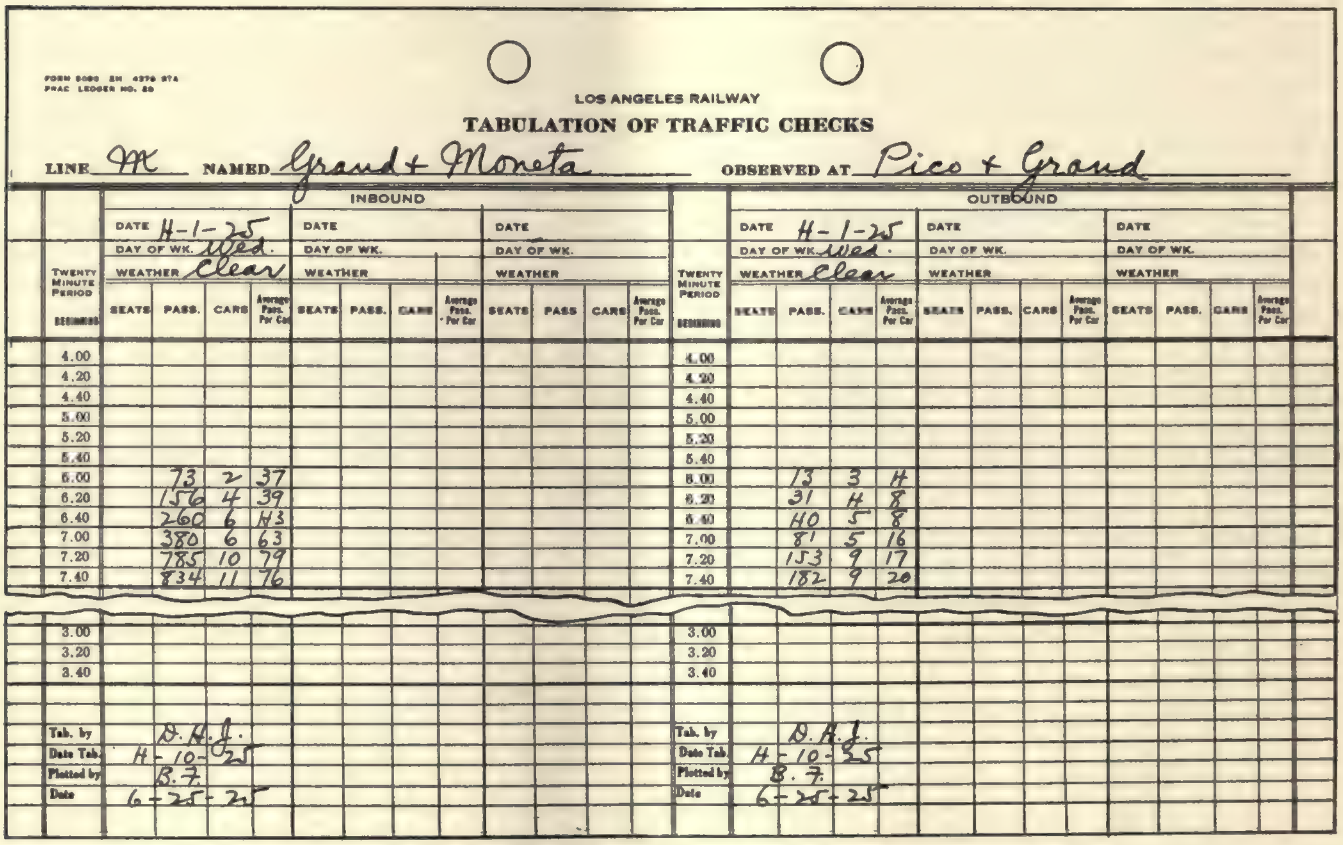


FORM 541-O—10M—5260 STA.
OPTIMO 16-LB. FOLIO
OBSERVER
____

LOS ANGELES RAILWAY
CHECK OF HEADWAY AND PASSENGERS CARRIED

Sheet____of____Sheet
Date________
Weather________ NAME OF LINE________Route________
Temperature________ OBSERVED AT________
Day of Week________

N—S—E—W ARR.—DEP.	INBOUND						OUTBOUND					N—S—E—W ARR.—DEP.
Car No.	Train No.	Destination	Seats	Pass.	Time		Car No.	Train No.	Destination	Seats	Pass.	Time



FORM 5080 2M 4276 STA
PRAC LEDGER NO. 20

LOS ANGELES RAILWAY
TABULATION OF TRAFFIC CHECKS

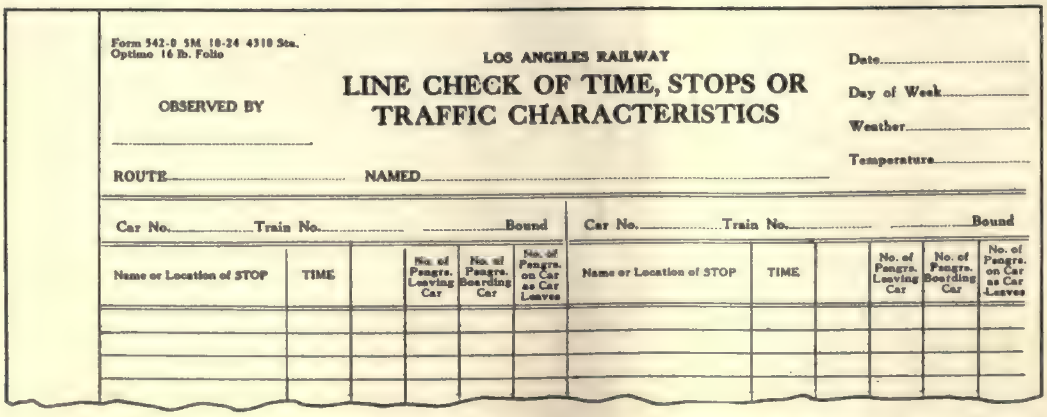
LINE M NAMED Grand + Moneta OBSERVED AT Pico + Grand

INBOUND

Twenty Minute Period Beginning	DATE 4-1-25 DAY OF WK. Wed. WEATHER Clear				DATE DAY OF WK. WEATHER				DATE DAY OF WK. WEATHER			
	SEATS	PASS.	CARS	Average Pass. Per Car	SEATS	PASS.	CARS	Average Pass. Per Car	SEATS	PASS	CARS	Average Pass. Per Car
4.00												
4.20												
4.40												
5.00												
5.20												
5.40												
6.00		73	2	37								
6.20		156	4	39								
6.40		260	6	43								
7.00		380	6	63								
7.20		785	10	79								
7.40		834	11	76								
3.00												
3.20												
3.40												
Tab. by		D. H. J.										
Date Tab.	4-10-25											
Plotted by		B. F.										
Date	6-25-25											

OUTBOUND

Twenty Minute Period Beginning	DATE 4-1-25 DAY OF WK. Wed. WEATHER Clear				DATE DAY OF WK. WEATHER				DATE DAY OF WK. WEATHER			
	SEATS	PASS.	CARS	Average Pass. Per Car	SEATS	PASS.	CARS	Average Pass. Per Car	SEATS	PASS.	CARS	Average Pass. Per Car
4.00												
4.20												
4.40												
5.00												
5.20												
5.40												
6.00		13	3	4								
6.20		31	4	8								
6.40		40	5	8								
7.00		81	5	16								
7.20		153	9	17								
7.40		182	9	20								
3.00												
3.20												
3.40												
Tab. by		D. H. J.										
Date Tab.	4-10-25											
Plotted by		B. F.										
Date	6-25-25											



Form 542-0 5M 10-24 4310 Sta.
Optimo 16 lb. Folio

LOS ANGELES RAILWAY
LINE CHECK OF TIME, STOPS OR TRAFFIC CHARACTERISTICS

OBSERVED BY
____

Date________
Day of Week________
Weather________
Temperature________

ROUTE________ NAMED________

Car No.________Train No.________ ________Bound

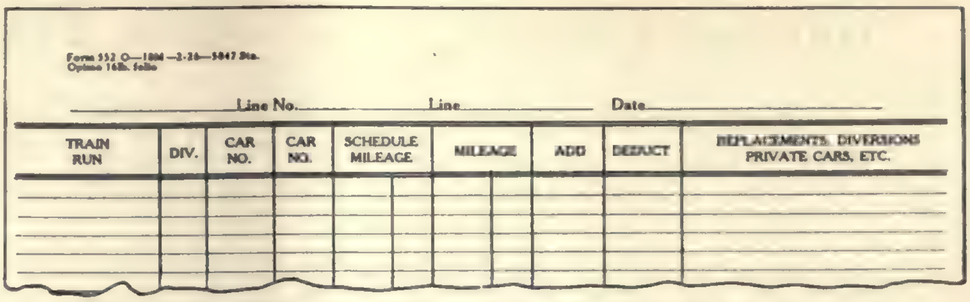
Car No.________Train No.________ ________Bound

Name or Location of STOP	TIME		No. of Psngrs. Leaving Car	No. of Psngrs. Boarding Car	No. of Psngrs. on Car as Car Leaves	Name or Location of STOP	TIME		No. of Psngrs. Leaving Car	No. of Psngrs. Boarding Car	No. of Psngrs. on Car as Car Leaves

From the checker's information at load point, a tabulation is made of the check in twenty-minute periods. This recapitulation of the traffic checker's data is placed on the second form.

Riding checks are made to obtain running times and peak loads between time points on line. Information obtained on the form shown at the bottom is used in establishing normal running time between various points. Fifteen to 25 checks are made, the average taken and 30 seconds allowance added to obtain normal running time.

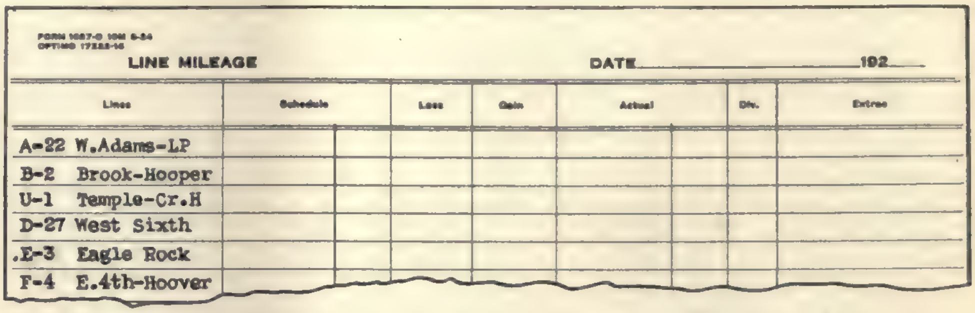
Forms used in traffic checks and tabulations by Los Angeles Railway



Line No. Line Date

TRAIN RUN	DIV.	CAR NO.	CAR NO.	SCHEDULE MILEAGE	MILEAGE	ADD	DEDUCT	REPLACEMENTS, DIVERSIONS PRIVATE CARS, ETC.

A daily compilation of car mileage is kept for each car on the system.



LINE MILEAGE DATE 192

Lines	Schedule	Loss	Gain	Actual	Div.	Extras
A-22 W.Adams-LP						
B-2 Brook-Hooper						
U-1 Temple-Cr.H						
D-27 West Sixth						
.E-3 Eagle Rock						
F-4 E.4th-Hoover						

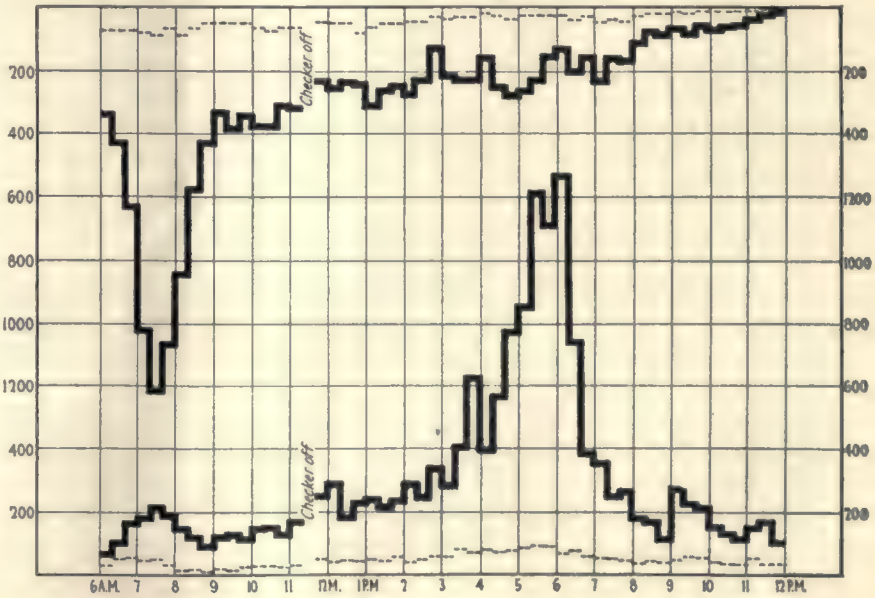
The actual mileage, loss, gain and schedule mileage are given for each line. This includes both car and bus operation

assigned this portion of the run to some work run number and thus has used it. Reliefs for the trainmen are allowed in the schedules. This company has no straight runs, there being at least a twenty-minute relief period at or near the center of the run in order that the crew may have time to eat. An exception is made to this in the case of the late night runs, that of necessity are made straight.

With the runs subdivided and portions assigned to work run numbers, the schedule is roughed out. It will be noted in the illustration showing the finished schedule that space is left for indication of the relief, when it comes on, and the work run number that relieves. The schedule is then typed on heavy bond paper, the work run table being placed on the right-hand side of the sheet, with the numbers listed consecutively. In the main schedule, the train run numbers are listed consecutively. This feature of the schedule makes it easy for the trainman to pick out the times of his work runs from the sheet. Particularly is this useful for the extra man who is given a run and has the allotted seven minutes in which to get his equipment together and copy off the times of his work runs. Checks have been made of the time required to obtain the same information from this form and from schedules not using the train run as a basis. With the Los Angeles system it requires 22 seconds for a trainman to find the two sections of his run and copy off the times. With a schedule in which the train run numbers are not keyed to the work run number, it required more than two minutes. Running time schedules vary with the time of day and are listed at the foot of the schedule. Altogether on the schedule shown there are seven changes in running times during the day in one direction and six in the other direction, though the difference between one time schedule and another may be between two or three points. The schedule shown was put into effect on Oct. 17 and covers the pre-Christmas season.

In setting up the running time in minutes between time points, no time is given between the last time point on the line and the terminal. The most important reason for this is that after a motorman leaves the last time point he is allowed to get to the terminal as fast as possible, taking into consideration safety of operation and courtesy. He will pick up few passengers, stopping principally to let off the few carried beyond his last time point, which usually is the last transfer point on the line. This speeding to the end of the line carries the few passengers left on the car to their destinations rapidly and creates public good will. Although no running time is given there is an established running time for this distance, which is available to trainmen and soon becomes known to them. However, they are permitted to make such time as they please. The time gained is added to the layover period.

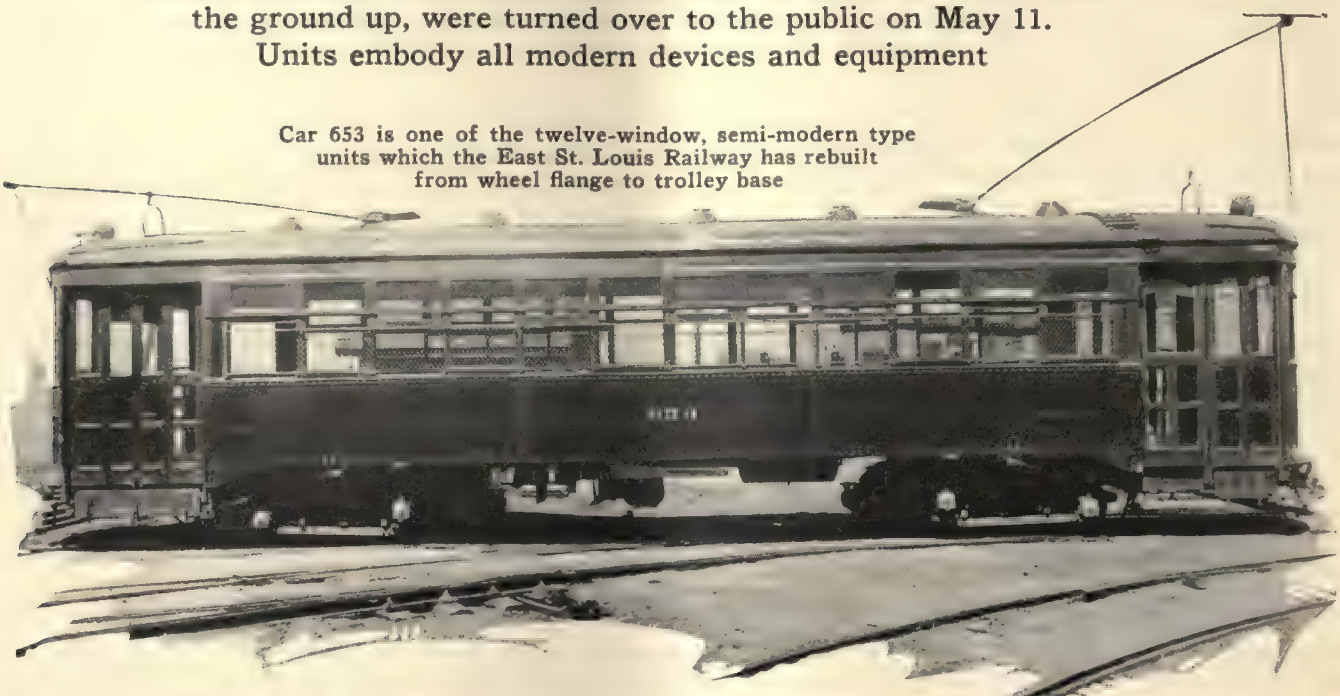
In addition to the work of making up schedules, the schedule department also compiles data on the car and bus mileage. These are made up on a form for each particular line for every day, and show the actual mileage on each individual car. In addition, another form shows the schedule mileage, the loss or gain and the actual mileage for each car line and bus line on the system. This is a daily recapitulation of the individual car and bus mileage sheet.



From the tabulation of traffic checks the usual chart is drawn to visualize the traffic situation. This graph indicates the number of passengers at a particular checking point for a twenty-minute period

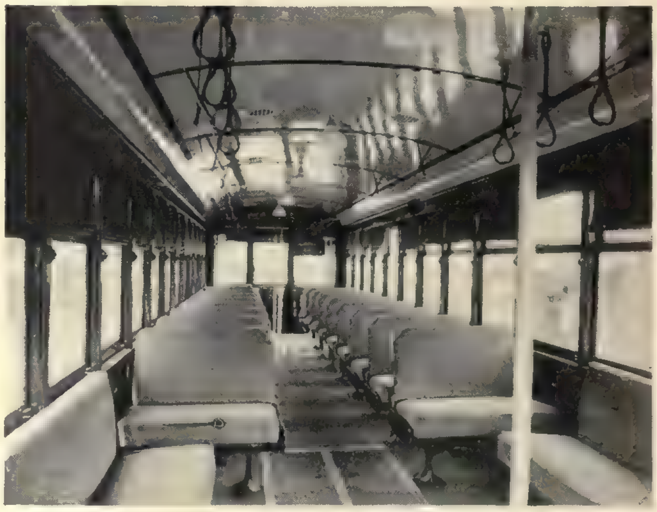
Another Chapter on Popular Transportation

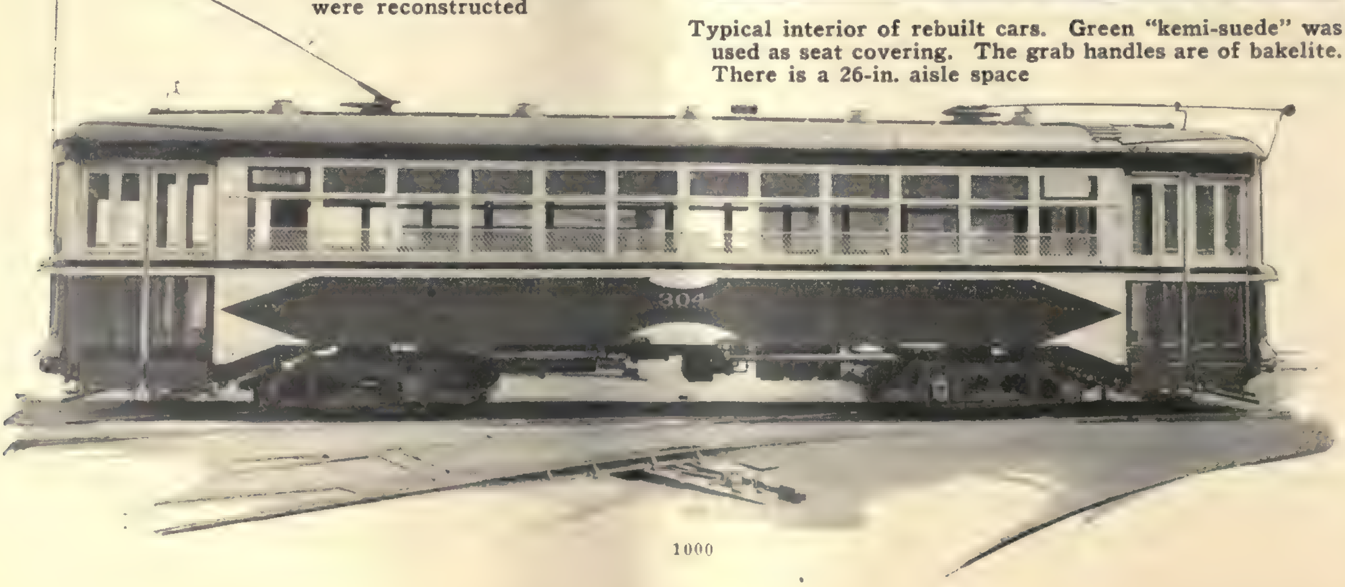
Six semi-modern cars, rebuilt by the East St. Louis Railway from the ground up, were turned over to the public on May 11. Units embody all modern devices and equipment


Car 653 is one of the twelve-window, semi-modern type units which the East St. Louis Railway has rebuilt from wheel flange to trolley base

LAST month the East St. Louis Railway, East St. Louis, Ill., wrote another chapter on popular transportation when six thoroughly rebuilt cars were shown to the public for the first time. The ceremony included a parade of the cars through the business district and over the divisions on which the cars will operate in the future. The units were placed in regular service on May 11. For the purpose of speed and on account of the scope of the reconditioning plan, the work was done in the shops of the St. Louis Car Company.

Modernization consisted, first, in completely stripping the cars, and, after the steel side plates and under frames were examined, the replacing of or welding all defective parts. The original interior finish of dark


Typical interior of rebuilt cars. Green "kemi-suede" was used as seat covering. The grab handles are of bakelite. There is a 26-in. aisle space



Car 304 is the same unit as shown above, ready to be placed in service. Six units were reconstructed mahogany was then refinished to a natural color, all defective parts first having been replaced. The interior metal trimmings also were refinished and headlining was installed. A new seating arrangement, consisting of eight cross seats per car placed on each side, and four short longitudinal seats, is in striking contrast to the old seating plan, which embodied five cross seats on each side of the car front and back, a long longitudinal seat opposite the cross seats and short longitudinal seats at each end on the same side as the cross seats. All of the new seats have deep spring cushions and backs and are covered with green "kemi-suede," a decided improvement over the rattan and wood construction of the old units.

New motors, geared for a speed of from 12 to 13 m.p.h., were installed on all the units; four 25-hp. motors on one unit and two 60-hp. motors on cars with maximum traction trucks. On the four-motor unit complete new wiring, a new light-weight truck and new electrical equipment were necessary, the latter including controllers and line switches. As an experiment the rewiring was done in Duraduct. Each car is equipped with full safety apparatus, including LD-4 devices for the operation of line switches. On each unit there are four air-operated doors; two have treadles and two are hand-operated. The doors are interlocked with control.

From the standpoint of boarding the car, considerable improvement is noted. This is due to the use of smaller wheels and because the unit as originally constructed contained drop platforms. Under the new arrangement the step heights are from 12 to 13 in., with a step from platform to the car body floor of 9 in.

As far as the exterior appearance is concerned, the company's standard orange color was specified as the basis for the new painting. The letterboard is painted orange and the window posts and windows are finished in cream color, below which has been traced a 4-in. black band, edged with old gold. In addition there is a 2-in. cream strip below the black band. This sets off a large orange colored panel which comes to a wedge point at the door posts. There are slight figures in the center of the panels to relieve the monotony. All parts are edged with black. By pointing the end of the side panels a streamline effect is obtained. Cream color has been used for the upper part of the doors, and the lower portion is finished in orange with the black and gold strip to match the decorative scheme of the car body. This treatment also obtains on the ends of the car. With the new headlight placed in the center of the dash, the orange panel effect has been extended to the dash, and brought to a wedge point at the headlight. Red was selected as the color for the car roof, with the under part finished in dark green.

On the outside of the car there are also several new departures from the company's standards in regard to the location of different pieces of equipment. In addition to the headlights having been placed in the center of the dash instead of on the roof, which is standard with the company, the gongs have been installed under the platform floor instead of on the roof, thus freeing this portion of the car of the unsightly guard that was placed around them for protection against damage by the trolley poles. Other distinct departures consist of dash illumination and the reduction in the height of the window guards. One car is equipped with the round rod type, the others with fine mesh type of guard. To complete rehabilitation the cars were renumbered.

Terminal Improvements on West Penn System

On April 26 the West Penn System opened its new terminal and office building, freight station and garage, built at a cost of $400,000, in Greensburg, Pa. This terminal and office building combines dignity of design and utility. It is a two-story-and-basement structure extending 50 ft. on Main Street and 125 ft. paralleling Fourth Street. Glazed terra cotta columns grace the Main Street side and the front of the building, and they, with the extending canopy marquee on the south, the platform roof and the contrasting terra cotta face brick, make the building attractive in appearance.

Terminal and office building of the West Penn System recently opened at Greensburg, Pa.

The first floor of the terminal building contains the public waiting room. News-stands, telephone booths, checking cabinets and comfortable seats, with an excellent lighting system, make this room one offering real public service. At the south end of the first floor a large and attractive room is provided for the display and sale of electrical appliances for household use. Offices for local executives, the cashiers, train dispatchers and ticket agents are also on this floor.

A freight station and garage was also placed in service in Greensburg by the West Penn System

On the second floor a well-equipped room for the railway trainmen is located. Here also are the offices of the division auditor, the division manager and his assistant, the division engineer and the superintendent of construction. The interiors on both floors are finished in glazed brick wainscoting with white upper walls and ceilings. In the finished basement provision is made for storage rooms, the repair shop of the appliance department and the boiler rooms.

A freight station building has been in use for some time. It houses the storeroom for the Greensburg division and the garage.

The opening of this new terminal marks the completion of a series of major improvements made by the West Penn System in Greensburg at a total cost of upward of $400,000.

N. O. P. & L. Bus School Completes First Year

WHEN graduation exercises of the bus school of the Northern Ohio Power & Light Company were held recently at Akron, diplomas were awarded to approximately 200 operators. Although this school was first established a year ago, it did not get in full swing until some eight months ago, when a permanent school room was opened at the Kenmore carhouse. All bus operators have been required to attend one session of school each week. Sessions have been held daily at 10 a.m. and 4 p.m. except Saturday and Sunday. Each department is assigned a 30-minute period.

The following subjects have been taught:

TRANSPORTATION DEPARTMENT

Company Organization—Operating rules, schedules, fare collections, reports, co-operation.

Bus Operation—Cleanliness of bus, personal appearance, heat and ventilation, personal conduct, accident and ejectment reports, care of injured and sick, care of persons asphyxiated. Prone-pressure method.

Public Relations—Courtesy, selling of service, information to the public, publicity.

General—Bulletins and special instructions, traffic rules and laws, handling of electric wires, selling company's securities, open discussion of all lessons.

MECHANICAL DEPARTMENT

Engine Troubles—General outline, motors, oiling, cooling system, carbon, ignition, gas and vacuum, review.

Chassis — Clutch, transmission, differential, propeller shaft, brake system, foot, shaft and rear axle, brake system level, brake system vacuum, front axle and steering gears.

Accessories — Tires, wheels and fenders, body, lighting, buzzers and horn, battery and starter, starting quick, stopping quick, open discussion at all lessons.

ACCIDENT PREVENTION DEPARTMENT

Accidents and Reports—The accident prevention department, what to do when accidents occur, when to make out accident reports, how to make out accident reports, why reports are required of all unusual occurrences on or near the bus, how to secure witnesses, their value, why they should be obtained, the effect of accidents on the company and the public.

Operation—Rough operation, speed, boulevard stops and right-of-way, safe operation at railway crossings, schedules and how to make them safely, buses colliding with other vehicles, bus collisions, bus and car collisions, making proper stops, review of past lessons.

General—Visiting while on duty, scuffling, playing jokes and results, individual accident records, the value of the accident record, fealty to the company, general review of the past 22 lessons, open discussion at all lessons.

The school is in charge of J. K. Petty, who was taken from the ranks of the bus operators. The entire course has been given in a series of lectures and questions, a final examination being required for graduation. Practical demonstrations and work were given in connection with the lectures, the school room being fitted for that purpose.

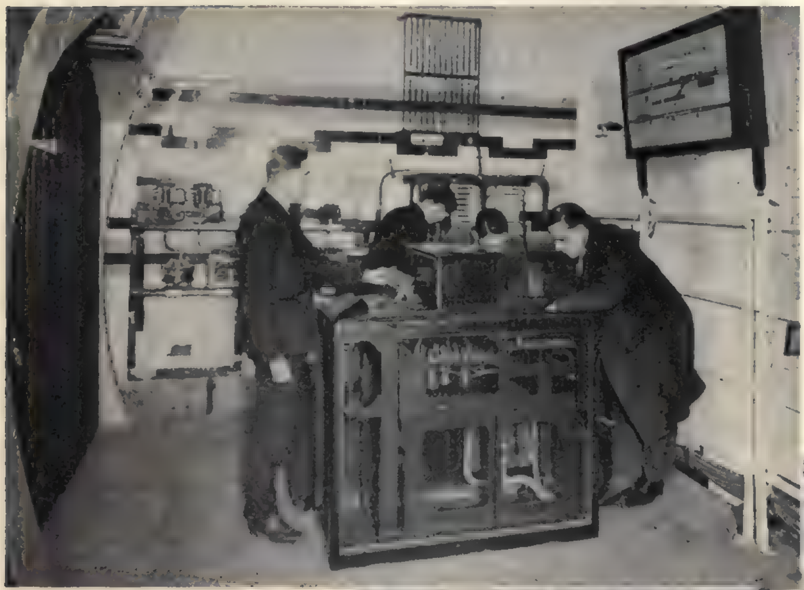
View of the graduating class of the N. O. P. & L. bus operators' school looking from the Elks auditorium stage toward the audience

Graduation exercises were held in the Elks Club auditorium, Akron, on April 20, at 10 o'clock in the morning and 8 o'clock in the evening—night operators receiving their diplomas in the forenoon and day operators receiving theirs in the evening. The exercises were attended by city officials, and Mayor D. C. Rybolt delivered the principal address in the morning and L. D. Carter, safety director of Akron, made the evening address. Diplomas were presented by A. C. Blinn, vice-president and general manager of the company. Wendell L. Willkie, of company chief counsel, presided. Music was supplied by the company orchestra.

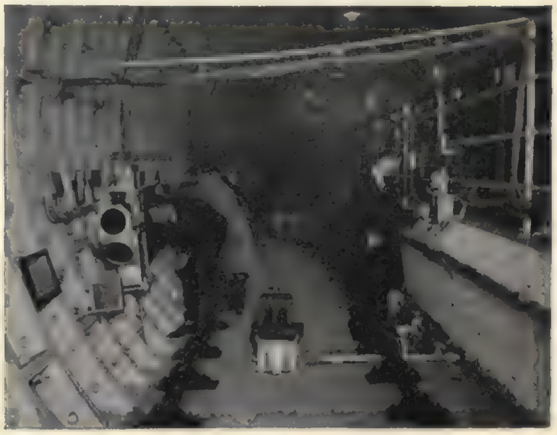
The company is planning the establishment of a school in Canton for the operators on the Southern division of the system.

A Signal School in a Tunnel

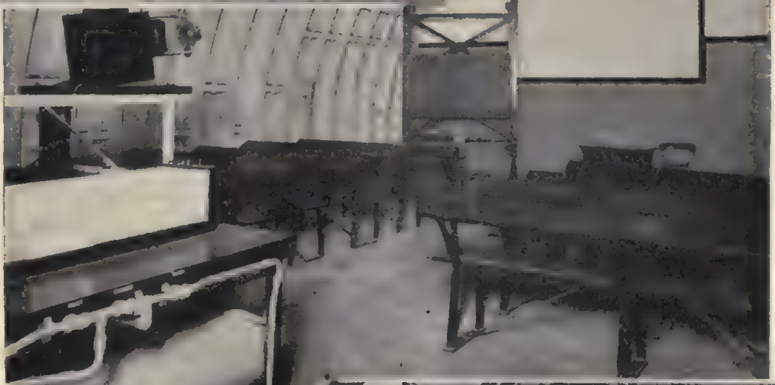
Classes for employees are held by London Underground Companies in unused section of South Kensington tube twice a week—Models of many kinds of signal apparatus are available for study



Above, signal interlocking frame with the casing removed



Above, electro-pneumatic tunnel signal



At right, the classroom of the London Underground signal school is provided with a projector and screen. Seats and desks accommodate 60 students

Below, experimental track circuit tank and fog repeater

OPPORTUNITIES for practical and technical training of signal linemen, fitters and installers are provided in a new school recently established by the London Underground Companies. Appropriately enough, the school is located in an unused section of the underground system at South Kensington. It is open to apprentices and signal linemen and to other employees who are interested in the work of the signal section and wish to prepare themselves for examination for better jobs. The method of training is to give a lecture in the school and to follow this by examination and experiment with the apparatus. The lecture room has a capacity of about 60 students. It is fitted with desks, blackboard, lantern and screen. Operation of the apparatus is explained and demonstrated by a qualified technical staff.

Monday evenings are devoted to exposition for apprentices of general principles, rules of signaling and operating practice. On Friday evenings the work is more advanced and covers all signaling, including the most recent a.c. installations. This is for the benefit of linemen and others who wish to keep in touch with the latest practice. At the end of each session an exam-

Daylight signal and semaphore

ination is held embracing both technical and practical work. The school is used also for the examination of individual linemen before they are placed in actual charge of signal sections on the railways.

An experimental track circuit for testing and demonstration purposes has been installed. By lowering or raising the water level in a nearby tank the effect of wet or dry weather on a track circuit can be demonstrated. On a bench running the length of the room is a miniature track. In front of the bench are arranged signals and train stops which are controlled from this track.

One end of the room is fitted up to represent a signal cabin complete with seven-lever power frame and illuminated diagram. The power frame controls five signals and one switch. A length of full-sized section of permanent way runs along the school on the lower level. In conjunction with this, signals and apparatus are connected up in the same manner as on the railways.

Switch mechanism and train stop showing circuit breaker box

Detroit Railways Show Enviable Decrease in Accident Figures

GROWING out of a campaign in the interest of safety, the Department of Street Railways, City of Detroit, Mich., reports an appreciable decrease in accidents for December, 1926. Analysis of the figures shows 36.5 accidents per 100,000 car-miles as compared with 39.1 for the same month in 1925, when the campaign was commenced by D. A. Smith, then general superintendent, and now general manager. According to another operating official of the company, other encouraging results are shown in the sphere of controllable accidents, the 1926 figures revealing only 15.9 accidents per 100,000 car-miles as against 23.9 for the previous year. The official last mentioned said:

"At the close of each month the operating division which has the smallest number of accidents is presented with a banner which is displayed in the carhouse. Each division is divided into teams of approximately fifteen men each and the members of the team which has the lowest accident record in the division are invited to a smoker given by the department. The competition for the division banners has become very keen and we anticipate even better results during the present year."

You Profit—
Others Gain from Your Experience!

See the Maintenance Competition announcement, page 1006.

Maintenance Notes

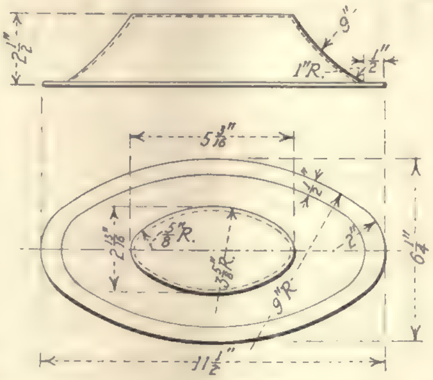
Economic Method of Salvaging Seat Pedestals

By A. M. Lindsay
Superintendent of Rolling Stock
Montreal Tramways, Montreal, Canada

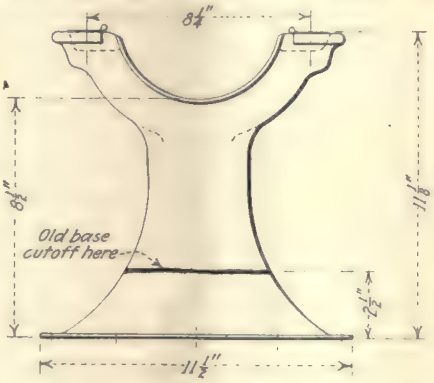
Bases of pressed steel car seat pedestals are subject to severe corrosion as they are in constant contact with the wet or moist floor of the car. The destructive action is more severe in some climates than others. The corrosion can be reduced materially and deterioration can be prevented by treating the bases when they are installed with one of the many adhesive asphaltic compounds on the market.

Finding that the deterioration of seat pedestals made it necessary to replace a large number of these on cars in service, a method of salvaging the old pedestals was worked out by the Montreal Tramways. This has proved satisfactory and economical. The various steps of the method are shown pictorially in the accompanying illustration. The method consists of cutting off the lower section of the pedestal which has deteriorated and replacing this with a new pressed steel section welded in place.

The first operation consisted of cutting off the defective pedestal with an acetylene torch on a line a little less than 2½ in. above the base. The upper portion of the pedestal is then placed in a jig and is milled accurately so that the cut will come exactly 2½ in. above the base line. The new seat pedestal base, made of a mild steel pressing which corresponds closely to the base portion removed, is drilled for the holding down screws and then is spot welded to the old pedestal top at four points. The assembled pedestal is then revolved between centers, as shown in Fig. 3, and the two parts are welded completely at the junction line by an acetylene torch. The joint is then dressed up on an emery wheel and then, after being heated, the base is dipped in melted No. 1 Reeferite compound. After painting the pedestal is ready to be returned to service.



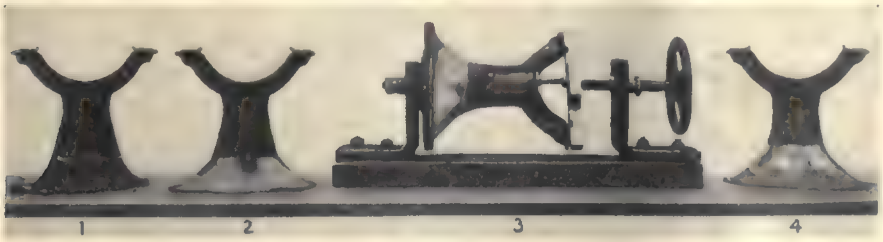
Seat pedestal base which is welded on



Detail of seat pedestal as reclaimed

The total cost of salvaging seat pedestals by this method is 84½ cents and is divided as follows:

	Cents
New pressed steel base	50
Drilling new base	1½
Cutting off old base	7
Milling pedestal	5
Welding and trimming	20
Dipping	1
Total	84½



Method of salvaging seat pedestals

The bottom of the pedestal is first cut off with the acetylene torch as shown in the illustration to the left and the new base is then spot welded into position as shown in the second illustration. By revolving the assembled pedestal between centers, as shown in Fig. 3, the entire junction seam is welded and the completed job, as shown in Fig. 4, is dressed up on an emery wheel.

Resistance Welder Used for Bonding Load

By J. E. Albert
Assistant to General Manager Charleston Interurban Railroad, Charleston, W. Va.

Erratic loads in bond testing have been overcome by a method developed by the Charleston Interurban Railroad, Charleston, W. Va. The difficulty we experienced with the ordinary bond-testing equipment was that power usually was fed from two directions on the line. With cars pulling current from both sides of the bond tester a very erratic load condition on the tester resulted. The current would not be constant for any length of time and as a result bond testing was a hit or miss proposition and results were very unreliable.

To eliminate the unstable condition testing is now being done after 1 a.m., when no cars are operating. The power supply is shut off at one end of the line so that we are assured of power from one direction only. A constant load of a little over 100 amp. for the bond tester is drawn through the resistance units of an Indianapolis welder hooked up on a line car. Two men precede the car with a Roller-Smith bond tester and each joint is tested as rapidly as the tester can be read.

The accuracy obtained is remarkable. The reading indicates whether the bond is entirely bad or what proportion its resistance bears to that of a perfect bond. With a little experience the man reading the bond tester has been able to guess accurately the proportion of broken strands in the bond. This testing apparatus has been made a permanent part of our equipment and periodical inspections are now being made at night.

Protection for Commutator V-Bands

By John S. Dean

Renewal Parts Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

SATISFACTORY results are reported by a large railway from the application of dextrine and plaster of Paris mixed with shellac as a protection for the front V-bands of commutators. In mixing the compound shellac is poured into the powdered dextrine and plaster of Paris and is stirred thoroughly until a fairly heavy paint-like mixture is obtained that will just drop off of the mixing stick. If the mixture is too thick it will crack off when dry.

Try this "B-Battery" in your railway motor hook-up, Bang-up Bearings By Better Babbitting.

If the mica V-ring is in good condition the string or tape band can be left off. All short circuits should be removed carefully and the V-ring cleaned. The adjacent ends of the commutator bars should also be cleaned. It is particularly important to remove all dirt and oil at the points where the commutator bars join the mica V-ring. This cleaning can be done readily with a small wire brush.

After the cleaning, a coat of shellac should be spread over the V-ring and onto the adjacent ends of the commutator bars. Then one coat of the mixed dextrine and plaster of Paris compound should be put on with a small brush over the surface of the V-ring and the adjacent end of the commutator bars so as thoroughly to fill up all cracks and joints. After the compound has dried thoroughly in the air, not less than three coats of a good air drying insulating varnish should be used for a final finish.

That Stunt You Did *May Win*

HAVE you stopped to consider that the very job you were doing this morning may have prize-winning possibilities? Many of the things which appear commonplace, and are standard practice with your company, may be unknown to other electric railway maintenance men. It is the personal experience which you have gained in handling maintenance problems on your road that enrich the literature on this subject, and help other maintenance men to do the job better.

Progressive men always keep their eyes open and their minds alert for new ideas. They look ahead and improve their practice by availing themselves of the experience of others. They wish to know what is going on not only in their own field of work, but in the industry as a whole. These are the men who soon become leaders in improved maintenance. With this thought in mind, ELECTRIC RAILWAY JOURNAL is endeavoring to secure more information on desirable maintenance practices, and broadcast the best maintenance kinks through its new Maintenance Data Sheet section.

Three Capital Prizes

First	**$200**
Second	**$100**
Third	**$ 50**

To help arouse interest several prizes will be awarded. Three capital prizes, the first of $200, the second, $100, and the third, $50, will be given to articles received before Aug. 1. In addition, a prize of $25 is to be given each month. This monthly prize is for the best maintenance idea published in the Maintenance Data Sheet section of the issue devoted to construction and maintenance, which is the third issue each month.

The next issue in which short articles contributed in the maintenance contest will be published is the June 18 issue. The time is getting short for you to get material into this particular issue, and the longer you wait the less chance you have of winning one of the monthly prizes in addition to a capital prize.

Condensed Rules for the Contest

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

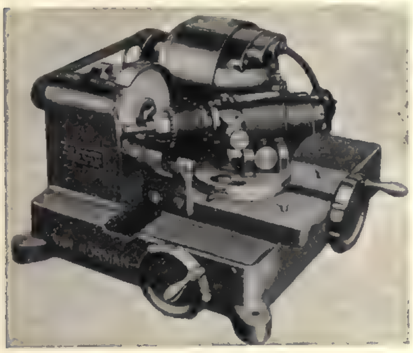
The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

New Equipment Available

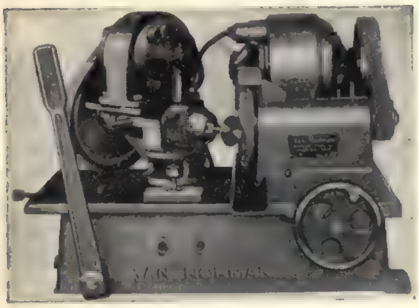
Valve Refacers for Bus Maintenance

VALVE refacers of two new types have been designed and are being manufactured by the Van Normal Machine Tool Company, Springfield, Mass. These machines are distributed by the Van Dorn Electric Tool Company, Cleveland, Ohio.

The type D motor-driven valve refacer was designed to meet the need in smaller service stations and garages. It will grind all valves of ¼ in. to 7/16 in. stem diameter and valves having a head diameter of 4½ in. The machine has a universal workhead, graduated for settings at 30, 40, 45 and 50 deg. The workhead and the wheelhead are driven by a single flat belt through flexible shaft, worm and worm gear. A ¼-hp. Westinghouse motor supplies the necessary driving power.



Type D motor-driven valve refacer for small service stations



Type E motor-driven valve refacer with double motor design and floating motor drive

The type E valve refacer is particularly good for heavy-duty work. It may be used for grinding valves up to ⅝ in. in stem diameter and 4½ in. head diameter. Valve reseating cutters and valve seat hones can be reground to the same angle as the ground valve. It is also applicable to grinding valve lifters, tappets, tappet screws, small spindle bolts and the like. The workhead can be turned to a 90-deg. angle with a slide range long enough to grind work having a maximum diameter of 2⅜ in. at the grinding point on the front face of grinding wheel. A 5-in. saucer wheel assists side wheel grinding.

The outstanding construction feature of this type E valve refacer is that it is driven by two motors, which make it possible to operate the wheelhead and workhead independently. These motors are of the high-torque, constant-speed type, insuring even grinding, and are of Westinghouse manufacture. A floating motor drive is another feature of this machine. In order to reduce vibration and thus produce better grinding the motor for driving the wheelhead is mounted slightly back of the center on a pivoted table, producing a spring tension against the pull of the belt. The V block and other standard features are included in the design of this type E refacer.

If you hesitate, procrastinate or miscalculate when you should lubricate, your bearings may have a terrible fate.

High-Low Water Alarm

A NEW signal panel has been designed by the General Electric Company for use as a warning signal to call an attendant in case of danger from overflow or emptying of a water tank. The panel is governed by one or two float switches.

With this panel an audible signal sounds immediately when either the predetermined high or low level of water is reached. The gong can be silenced by the attendant upon his arrival, and the silencing switch does not have to be reset manually after the float switch takes a normal position. "High" and "low" signal lamps are provided, either of which lights when the predetermined level has been reached, remaining lit until the float takes a normal position.

The panel can be used for a one-level signal by omitting the float switch for the other level. It can also be used on pressure systems, but when single-pole float or pressure switches are used it is necessary to add a relay in place of the other pole.

Wide Angle Floodlight Projector

FOR use where long throw and high beam candle-power are essential a new 24-in. floodlight projector, known as type SCA-24, has been developed by the Westinghouse Electric & Manufacturing Company, particularly for railroad yard lighting and similar applications. The large diameter of the reflector in the new floodlight makes possible a wide angle of light with high over-all efficiency. Its long focal distance gives good beam concentration for long-range work, such as is particularly desirable in yard lighting.

The 24-in. parabolic chromium plated brass reflector is mounted in a cast aluminum alloy frame with a spun sheet aluminum back. The lens, of heat-resisting glass, is held in a door which opens from the front, swinging sideways. Thus it is possible to renew lamps and clean the reflector without interference from the door.

Side of floodlight projector

The floodlight is mounted so that it can be tilted upward where its position is such that approach from the front is not practical. A stop is provided so that it is unnecessary to aim the projector each time it is moved from position. Focal adjustment is provided by three screws, which operate independently, two for "in" and "out" and lateral motion of the lamp, and one for adjustment of focal distance from the reflector.

The reflector is entirely inclosed, no ventilation being required. It is furnished for either narrow or wide beam and with either a plain or spread lens. The visor is supplied as an accessory.

Association News & Discussions

Economics of Railroad Electrification*

By Sidney Withington
Electrical Engineer New York, New Haven & Hartford Railroad,
New Haven, Conn.

INSTALLATION of facilities for electric traction usually involves large amounts of additional capital, and it is obvious that unless the return from the electric operation—either direct or indirect—more than offsets the added fixed charges, including interests, depreciation, taxes, etc., the project cannot be justified.

The major advantage of electrification may be said in general to be fuel economy, either through the application of hydro-electric power, where such power is available, or through the use of steam power plants, where power can be economically generated. The steam locomotive has been improved recently by increasing steam pressures and by the application of such devices as mechanical stokers, feed water heaters, superheaters, limited cut-off, "boosters," etc., to a point where its efficiency in some cases may be as high as 8 per cent. This apparent efficiency, however, is reduced when losses incurred in "firing up," waiting at terminals and stations, operating at unfavorable loads, or coasting are considered. Poor handling on a run (where supervision is often difficult) may be a cause of decreased efficiency and wasted fuel. Fuel burned in a power plant is, by and large, burned under conditions favorable to economy. Individual machines exhausting at high vacuum can usually be operated at favorable loads. There is opportunity for good heat balance as a rule, and often an inferior quality of fuel may be utilized. Power plant operation at efficiencies of 20 per cent is not unusual. The power, of course, must be delivered from the power plant to the locomotives and thence converted into mechanical energy at the drawbar, and comparisons should be made on this basis, but even considering these losses, the overall fuel consumption under electric operation, other things being equal, is undoubtedly well under one-half that under steam operation.

The development of the Diesel electric locomotive may change the entire problem of economical railroad operation. The Diesel engine is of very high thermal efficiency and is in many ways a promising form of motive power. It is, however, now in its early stages of development, and is as yet available only in relatively small units. Not enough is known of its performance under operating conditions to determine how far its development will continue.

Another economy of electric operation is the maintenance of electric locomotives as compared to steam. This is especially true in the "engine house" expenses. The care of the electric locomotive at engine terminals is extremely simple compared to the attention which it is necessary to give to steam locomotives, which must undergo cleaning of fires, dumping of ashes, boiler washing, coaling, watering, and must be turned around at the end of each trip.

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 9-11—**Midwest Electric Railway Association, annual meeting, Hotel Chase, St. Louis, Mo.**

June 13-16—**National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.**

June 15-16—**American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24 — **American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1 — **Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1 — **Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

There are numerous other advantages which may accrue on account of electrification in individual instances. One of these is abatement of smoke and noise. This is, of course, especially true in urban districts, but the advantages are difficult to evaluate, and it is easy to give them undue importance. The smoke from locomotives is usually but a small part of the smoke in the atmosphere of large cities. There is, however, sometimes a controlling motive in the elimination of smoke from long tunnels, not only where heavy passenger traffic is concerned, but also where freight is largely handled. The elimination of smoke automatically increases the capacity of tracks through long tunnels which often constitute limitations or "bottlenecks" in railroad operation.

Relief of Congestion May Justify Electrification

Track or terminal congestion has sometimes provided a controlling justification for electrification. The electric locomotive is practically unlimited in capacity, for additional units may be added almost indefinitely as required, all controlled by one crew. The capacity of the steam locomotive is controlled by track clearance and weight limitations and consequent mechanical considerations. Adding units of steam locomotives is not economical, as each added locomotive requires its own crew.

Congestion in terminals has in some special instances been relieved by electric operation, and in Philadelphia the necessity for general rearrangement of facilities was postponed by electrifying the suburban service. Electric traction made possible the operation on two levels of the passenger yard at the Grand Central Terminal at New York, and the utilization of the territory over the tracks for revenue-producing buildings.

Electrified suburban operation provides a solution for a number of problems. With motors installed on the cars themselves, operated as multiple unit equipment, rapid acceleration is possible, which in turn means faster schedules, especially where stops are frequent. Switching problems are, to some extent, simplified. Suburban electrification, however, means duplication of engine facilities at the end of the suburban territory, and this involves heavy expense which it may be difficult to justify.

Electrification has been of great value in mountainous country in making regeneration of power possible on long, descending grades. The absorption of the energy of a heavy train going down hill, by feeding it back into the power system where it can be usefully employed, is far more desirable than using such energy up in heating brakeshoes and wearing out car wheels.

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*Abstract of a paper presented before the Affiliated Technical Societies of Boston, Feb. 17, 1927.

To balance the numerous advantages of electrification, there is first to be considered the very high initial cost of the new facilities which are required. These facilities may be roughly divided into three main parts: first, the power plant; second, the power distribution system to convey the power to the locomotive; and third, the locomotives themselves. The railroad must pay interest and taxes on each dollar of the investment which is required, and must also lay aside money for replacement when it becomes necessary through wear and tear or through obsolescence. These fixed charges constitute the first and perhaps the largest expense in connection with any electrification project.

INVESTMENT EXPENSE OF ELECTRIFICATION IS HEAVY

A railroad which is electrifying may find it desirable to purchase power instead of producing it in a plant of its own. If this is the case, the annual charges are still borne by the railroad, but are in the form of payments to the power company for the required power plant capacity to take care of interest and depreciation (or "replacement reserve") as figured by the power company.

The railroad must itself supply the funds for the construction of the power distribution system along the right of way. This is a large item and the annual charges are thus correspondingly heavy. The cost of maintaining the distribution system is one of the largest single items of expense of electric operation. This cost is not only direct, in the form of actual material and labor required, but also indirect, in the form of interference with operation while maintenance work is being performed.

The cost of the electric locomotives themselves is relatively high compared with steam locomotives of equivalent characteristics. This additional cost may in some instances be balanced by increased mileage, for the electric locomotive is available for service many more hours per year than the steam locomotive, but the demands of traffic, especially the so-called "fleet movement" of suburban service toward the city in the morning and from the city at night, often limits the mileage which can be made by the equipment, so it is usually the case that the electric motive power costs considerably more than the steam locomotives which are thereby displaced.

ELECTRIFICATION PROJECTS INAUGURATED FOR VARIOUS REASONS

Each railroad which has up to this time exchanged steam for electric operation has done so for some specific reason; that is, the solution of some local problem; and in few, if any, instances have general economic considerations solely governed. In each instance the electrification has well performed the requirements.

About a dozen steam railroad electrification projects, inaugurated for one reason or another, are in operation over more or less extensive territories, in addition to a number of electrically operated tunnels. The Chicago, Milwaukee & St. Paul, the Butte, Anaconda & Pacific and the Great Northern operate in mountainous country in the Northwest where fuel is extremely expensive and hydro-electric power exceptionally plentiful. Fuel saving and regeneration of power on long down grades were therefore controlling justifications, in spite of the fact that traffic density is relatively light. The Great Northern had also to consider operation through the long Cascade Tunnel.

The New York Central and Long Island Railroads operate heavy suburban passenger service electrically in the vicinity of New York. These projects were originally made necessary by tunnel operation. The Baltimore & Ohio at New York, the Pennsylvania at Philadelphia, the West Jersey & Seashore at Camden, and the Illinois Central at Chicago, each operates electrically heavy passenger suburban service. These electrifications were inaugurated on account of density of traffic on main line tracks, with few branch lines to complicate the installation and add to expenses of operation.

The Virginian and Norfolk & Western Railroads operate extremely heavy coal trains over tracks the capacity of which had been reached under steam operation. Trains up to 9,000 tons each are now handled by electric locomotives over heavy grades. The locomotives regenerate power going down hill, thus conserving energy and reducing wear and tear on brakeshoes and wheels.

ALL CLASSES OF SERVICE OPERATED ELECTRICALLY ON NEW HAVEN

The New York, New Haven & Hartford Railroad operates electrically between New York and New Haven local suburban service, through passenger service, freight service, and yard switching, and, through its subsidiary, the New York, Westchester & Boston, operates interurban service between New York and New Rochelle and White Plains. The New Haven is the only railroad in this country which thus operates on one system all branches of service electrically. The traffic is extremely dense, and the fact that it is so largely confined to one main line with few branches makes it ideal from the point of view of economical electric operation.

In addition to these examples of electric operation, a number of steam railroads are operating tunnels by electric power, utilizing electric locomotives to haul trains through the tunnels. Among these are the Pennsylvania at New York, the Baltimore & Ohio at Baltimore (this was the second oldest application of electric traction to steam railroads, the Nantasket Beach Branch of the New York, New Haven & Hartford having been the earliest), the Boston & Maine at North Adams (Hoosac Tunnel), the Grand Trunk at St. Clair Tunnel, and the Michigan Central at Detroit River.

ALTERNATING-CURRENT VS. DIRECT-CURRENT SYSTEM

There have been developed in this country two general systems of electrification—the alternating-current, or single-phase system, and the direct-current system. The single-phase system usually employs 11,000 volts in the trolley over the tracks at 25 cycles per second. The direct-current systems employ voltages which vary from 600 to 3,000. The lower voltages are distributed by third rail, while distribution above 1,200 volts is usually by means of overhead trolley. The chief exponents of the direct-current system at present are the Long Island, the West Jersey & Seashore, the New York Central, and the Baltimore & Ohio, all with third rail; and the Illinois Central, the Butte, Anaconda & Pacific, and the Chicago, Milwaukee & St. Paul, with overhead trolley. The principal single-phase systems are the Norfolk & Western, the Virginian, the Great Northern, the Pennsylvania, and the New York, New Haven & Hartford Railroad.

Each system has some advantages over the other, and each has its advocates, who enthusiastically support their opinions with loud voices. There is not yet sufficient information available to convince every one as to the undoubted superiority of one system or the other when all classes of service are considered, and thus to permit standardization throughout the entire country.

Public Utilities Advertising Association Will Stage Utility Copy Exhibit

AN EXHIBIT of public utility advertising is being arranged by the Public Utilities Advertising Association in connection with their meetings at the 23d annual convention of the International Advertising Association to be held June 27 and 28 at the Albany Hotel, Denver, Col. It is to be the only exhibit at the convention. Series after series of institutional advertising, a newly developed Washington dash sign and an extraordinary quantity of direct mail matter have been received and are to be included in the display. More than 7,000 proofs of utility advertising published in the past year have already been sent to Denver. Arrangements have been made with the Public Service Company of Colorado to set up a special exhibit in the windows of its Denver offices.

Frank LeRoy Blanchard, president Public Utilities Advertising Association, director of advertising and news Henry L. Doherty & Company, New York, N. Y., will preside.

The program is outlined below. The meetings will be held in the Magnolia Room:

Monday Afternoon, June 27, 2 P.M.

2:00. President's Address, Frank LeRoy Blanchard.

2:30. "Why National Utility Associations Believe in Advertising," by Paul S. Clapp, executive director National Electric Light Association, New York, N. Y.

Questions and Discussion.

3:00. "How to Buy Radio Time and What to Do with It," by Henry Obermeyer, assistant to vice-president Consolidated Gas Company, New York, N. Y.

Questions and Discussion.

3:45. "Why Newspapers?" by J. C. McQuiston, advertising manager Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Questions and Discussion.—Other Media.

4:30. Report of Public Utilities Advertising Association Committee on Costs and Results, by its chairman, A. C. Watt, of

Hodenpyl, Hardy & Company, New York, N. Y.

5:00. Questions and discussion on addresses and papers of the afternoon session.

Tuesday Afternoon, June 28, 2 P.M.

Presiding: H. M. Lytle, vice-president Public Utilities Advertising Association, and vice-president Chicago Rapid Transit Company, Chicago, Ill.

2:00. "The Future of Organized Advertising," by W. Frank McClure, chairman Advertising Commission and vice-president Albert Frank & Company, Chicago, Ill.

2:30. "Percolators vs. Paris Hats—Advertising Appliances the Department Store Way," by Miss Dorothy Dignam, McJunkin Advertising Company, Chicago, and copywriter for Commonwealth Edison Electric Shops, Chicago, Ill.

Questions and Discussion.

3:15. "Advertising—And Informing the Public," by Labert St. Clair, director of advertising American Electric Railway Association, New York, N. Y.

Questions and Discussion.

4:00. "Where Does the Agency Fit In?" by James O'Shaughnessy, executive secretary, American Association of Advertising Agencies, New York, N. Y.

Questions and Discussion.

4:45. Report of Public Utilities Advertising Association Committee on Better Copy, by its chairman, Irving M. Tuteur, McJunkin Advertising Company, Chicago, Ill.

5:00. Questions and discussion on the addresses and papers of the afternoon session.

Plenty of Entertainment at C.E.R.A. Meeting

NUMEROUS entertainment features have been arranged by the program committee of the Central Electric Railway Association for the summer meeting, June 29 to July 1, as well as three business sessions. The latter will be conducted on Wednesday, Thursday and Friday mornings beginning sharply at 9:30 o'clock. Announcement of the subjects will be published in the form of a program and mailed to each member in about two or three weeks.

Afternoons and evenings during the meeting have been wholly set aside for the entertainment of the members, their families and such guests as they may wish to invite. On Wednesday afternoon there will be a tour through the Ford Motor Company plant. Wednesday evening an informal dinner and program of entertainment will be held at 6:45 o'clock followed by dancing in the Italian Room of the Book-Cadillac.

On Thursday afternoon at 1:30 o'clock there will be an excursion to Bob-Lo Island, 18 miles south of Detroit, where there will be games and contests for the children and a golf tournament, dancing and other entertainment for the members. Ladies and children attending the convention may leave Detroit as early as 9:30 o'clock in the forenoon if they wish to spend the whole day at the resort. Entertainment on Thursday evening will be informal dancing in the Italian Room of the Book-Cadillac.

C.E.R.A. Traffic Association Meets

THE Central Electric Traffic Association held its convention at the Tuller Hotel, Detroit, Mich., on May 18 and 19. Reports of the standing and special committees were presented. Members present were: O. H. LaZelle, C. W. Randolph, H. G. Mason, C. D. Hardin, W. S. Rodger, N. Rumney, R. B. McEachran, R. Thompson, F. L. Ackerman, C. O. Sullivan, C. J. Laney, J. A. Greenland, W. S. Whitney, Mr. Herbert, G. W. Quackenbush, C. M. Byrne, F. L. Boyer, J. K. Coberly, R. M. Glick, V. T. Barry, W. L. Snodgrass, F. D. Norveil, W. L. Myers, C. J. Collins, A. E. Wafer, J. H. Crall, L. S. Gay, E. L. Hukill, H. W. Smith, O. A. Small, Mr. Craft, L. A. Goodrich, O. H. Murlin, J. O. Motto, E. Hamprecht.

Committees Named by Wisconsin Utilities Association

JOHN ST. JOHN, recently re-elected president of the Wisconsin Utilities Association, has appointed eleven general committees to carry on the research, educational, technical and accident prevention work for the new fiscal year. The chairmen and their committees follow:

Advisory—George H. Wilmarth, Eau Claire, chairman; L. N. Boisen, Chicago; R. B. Brown, J. P. Pulliam, S. B. Way, Milwaukee; G. C. Neff, John St. John, Madison; D. E. Callender, Racine, and Harold L. Geisse, Wausau.

Information Bureau—J. P. Pulliam, Milwaukee, chairman; John N. Cadby, Madison, secretary; R. B. Brown, S. B. Way, Milwaukee, and G. C. Neff, Madison.

Legislative—B. W. Arnold, Milwaukee, chairman; Harold L. Geisse, Wausau; George H. Wilmarth, Eau Claire; J. P. Pulliam and W. A. Jackson, Milwaukee.

Accident Prevention and Insurance—Ivan L. Scott, Madison, chairman; C. B. Boulet, W. Koehler, Milwaukee; M. R. Frederickson, Wausau; Lucinda Gothe, Ashland; W. H. Mann, Eau Claire, and J. W. Oliver, Waukegan.

History—Walter L. Haight, Racine, chairman; Ralph Drew, Wausau; A. R. Gale, Beloit; L. W. Cobler, Eau Claire, and F. W. Huels, Madison.

Educational—A. J. Goedjen, Menominee, Mich., chairman; F. W. Huels, Robert Quick, Madison; Arthur E. Johnson, Eau Claire, and A. J. Rowland, Milwaukee.

Preservation of Structures—James G. Allen, Lake Geneva, chairman; E. C. Brenner, E. J. Steinberg, Milwaukee; John C. Felton, La Crosse; R. M. Howard, Winona; E. J. Kallevang, Madison, and I. R. McCall, Chicago.

Women's—Mildred Manley, Lake Geneva, chairman; Amanda L. Buscher, Green Bay; Florence Clark, Lillian Minch, Madison; Mrs. Zilla R. McClure, Erna Burzlaff, Milwaukee, and Ruth C. Tarum, Eau Claire.

Co-operation with Educational Institutions—Harold L. Geisse, Wausau, chairman; W. C. Lounsbury, Superior; Lloyd V. Ballard, Beloit; W. C. Butterworth, Platteville; J. W. Dumont, Whitewater; W. A. Exner, Ripon; John G. Felton, La Crosse; Dean E. A. Fitzpatrick, Ewald Hasse, M. C. Potter, Milwaukee; Prof. S. W. Gilman, Geol P. Hambrecht, H. W. Schmidt, Madison, and Omar Loop, Superior.

Public Speaking—M. H. Frank, Fond du Lac, chairman; W. C. Butterworth, Platteville; J. G. Felton, La Crosse; F. A. Coffin, Milwaukee; C. A. Dow, Eau Claire; M. R. Frederickson, Wausau; Walter Haight, Racine; W. J. Hodgkins, Ashland; J. E. Horsman, Rice Lake; C. R. Phenicie, Green Bay; E. F. Rider, Oshkosh; R. C. Walter, Madison, and A. P. Gale, Beloit.

Subjects Announced for Wisconsin Accountants Meeting

ACCOUNTANTS of electric railway, electric and gas companies in Wisconsin will hold their annual convention at the Northland Hotel in Green Bay, June 17 and 18. James H. McGillan, Mayor of Green Bay, will address the convention on "Public Relations Between the Public Utility and the Community." L. E. Gettle, chairman of the Railroad Commission, will talk on "Valuation as Affected by Recent Court Decisions."

Speakers and their subjects at the first morning session will include R. E. Moody, Milwaukee, "Review of N.E.L.A. Accounting Section's Convention"; M. Gass, Milwaukee, "Proper Distribution of Costs in Automobiles, Trucks and Transportation Equipment." At the first afternoon session C. B. Boulet, Milwaukee, will talk on "The Accountant's Place in the Safety Program"; H. P. Taylor, Green Bay, "Employees' Education"; Robert J. Johnson, Milwaukee, "Accounting Problems in Connection with Industrial Gas and House Heating Customers."

The second morning session will be opened with a round-table discussion on "Accounting Problems in Connection with Bus Operation." Warren Montgomery, Madison, will lead the debate. J. E. Gray, Madison, will read a paper on "Apportioning Expenses Between Merchandising and Operation." Sam R. Hatch, Milwaukee, has for his subject, "Accounting Treatment of Property Retired." Previous to Mayor McGillan's address the section will elect officers for the new year.

Two other speakers will be added to the program, which will be concluded in the afternoon with an inspection trip through the new Bayside generating station and the offices of the Wisconsin Public Service Corporation.

A dinner and dance will be held at the Door Country Club in Sturgeon Bay the first evening. Convention arrangements are being made by D. W. Faber, A. L. Buscher, H. P. Taylor, L. C. Christiansen, L. P. Ziebell, L. P. Works and G. S. Meyrick of the Wisconsin Public Service Corporation, Green Bay.

American Association News

Service Betterment

FINAL committee reports were assembled at the meeting of the service betterment committee held May 27 at the association headquarters in New York. Notes and sub-committee reports had been developed by the chairman, S. E. Emmons, into a tentative report, and following a discussion on a number of items the report was completed.

Members present were E. A. Palmer, A. E. Potter, A. C. Spurr, J. C. Thirlwall, W. E. Thompson, C. D. Smith, John A. Dewhurst and S. E. Emmons, chairman.

The News of the Industry

Paving Relief Denied in Wheeling

Wheeling, W. Va., voters on May 26 rejected the proposed amendment to the city charter which would permit the Council to grant relief to electric railways from paving obligations by a vote of 9,225 to 7,716. The amendment, if ratified, would have empowered the City Council to determine when and where the railways should pave. The ordinances under which the railways now operate provide they shall pay for all paving between their tracks. The amendment was defeated despite a determined campaign of the Wheeling Traction Company, which advertised liberally in all the newspapers by letters and on the radio. A. C. Spurr, general manager, also made talks before all the civic clubs. The proposal was supported editorially by the newspapers.

New Transfers on Buffalo Local Lines

The International Railway, Buffalo, N. Y., adopted two new types of transfers on its local lines effective May 29. The new transfer system is aimed to speed up service on the one-man cars which now are being operated on almost every local line in the city. Under the system which has been in effect for a number of years operators were required to punch the time and the destination line of passengers.

One type now in use is for passengers who require a single transfer to reach their destination line. No other transfer will be issued when this type of transfer is presented by a passenger. The second type is for passengers who require two or more transfers to reach a destination line. This latter form has an attached stub, which is accepted as fare on the intersecting line, while the body of the transfer is retained by the passenger to be used on the third line. Passengers using this type of transfer are required to give the names of all lines over which they will travel to reach their destination, so that the names of the lines are punched upon the body of the transfer.

The transfers also are subdivided into in-bound and out-bound forms and the date is prominently displayed in boldface type upon the face of the transfer. The company believes these two new forms will eliminate much of the transfer abuse which has been detected in the past. Before the new transfer system went into effect the International Railway used a series of three-column 8-in. advertisements in the daily newspapers to acquaint car riders with the details of the new plan; posters were displayed on the dashboards of all cars and swinging signs telling of the change were placed inside all the local cars.

The first of the series of newspaper advertisements reproduced a typewritten letter signed by President Yungbluth and addressed to the car riders of Buffalo asking them to read the newspaper advertisements which were to follow. Later advertisements reproduced samples of the new transfers with a detailed description of how they were to be used. The company says this newspaper advertising campaign, linked with the car posters and swinging signs, helped riders to adopt the new system wihout any confusion.

Hearings on Chicago Bills Concluded

Amended Traction Bills Begin Course Through State Senate—Score of Amendments Suggested—New Bills Represent Tacit Agreement of City and Companies for Local Transportation Settlement

FINAL public hearings on the five Chicago bills which were introduced in the Legislature at Springfield on May 17 were concluded on May 31 by the joint legislative committee on public utilities and the documents were reported to the state Senate with recommendation that they be passed. The public discussion on the legislation, called for May 31, was cut short after a score or more amendments had been suggested by the local transportation committee of the Chicago City Council and a suggestion that Mayor Thompson of Chicago be invited to discuss the bills had been heard from Judge John M. Harlan, representative of F. J. Lisman & Company, who has vigorously opposed the bills at every turn. Of the various amendments urged, four were ultimately adopted by the committee and attached to the bills as they were sent to the Senate.

Summarized, the provisions in the amendments are as follows:

1. That no terminable permit can be granted and become effective without submission to a referendum.
2. Power of the Governor to appoint all employees, fix salaries and supervise all expenditures of the proposed county transit commission is removed.
3. The city of Chicago is to be relieved of the necessity of assuring the cost of moving public utility properties which would have to be relocated during construction of subway.
4. Any permit or grant to a street railway running for less than a year shall not be held to be a terminable permit.

Revisions recommended by the Chicago Aldermen, some of which were covered by the amendments approved by the committee, included:

1. Placing the expense of relocating public utility wires and conduits, etc., in the construction of subways on the companies instead of on the city as proposed in bill No. 1.
2. Permitting the city to grant either a terminable permit or a fixed term franchise.
3. Granting of power to the city to terminate indeterminate permits when the companies fail to make extensions or render efficient service.
4. Giving the power to the surface lines as well as the elevated lines to acquire other local transportation facilities.
5. Submission of all railroads doing a local or suburban business within the district to the jurisdiction of the proposed transit commission.
6. Appointment of all five members of this commission by the Mayor of Chicago, thus removing the Governor's control over the board.
7. Substitution of the Durso and McCluggage home rule bills for the present bill which proposes to create a county transit commission.
8. Issuance of terminable permits only after a public referendum. In addition to the proposals made by the Aldermen, the legislative committee listened to several prominent Chicago real estate men and bankers who expressed themselves as being highly favorable to the indeterminate permit.

The first and fourth amendments were offered by Senator Richard J. Barr in behalf of attorneys for the transportation companies who originally introduced the bills. Amendment No. 1 supersedes a clause in bill No. 1 which provides that all grants made by the city following the passage of enabling legislation, regardless of duration, shall be indeterminate permits. This feature, it was pointed out by critics of the measure, would make it virtually impossible for the city to extend the present six-month Surface Lines franchises even for a single day, without giving the companies a perpetual grant.

In presenting amendment No. 4, Senator Barr explained that the framers of the bills had deemed it unnecessary to make provision for a public referendum inasmuch as the Governor of the state and the Mayor of Chicago had both previously announced that any plan for the settlement of the local transportation problems must first be submitted to popular vote before becoming an ordinance. Definite provision for a referendum, however, he said, was being inserted in the bill to satisfy members of the local transportation committee and other civic bodies.

Promising a complete and permanent solution of Chicago's complex twenty-year old railway problem, the new bills represent the tacit agreement of both city administration and local transportation companies as to legislative acts necessary to validate plans for a unified transit system. The documents themselves were sponsored and drafted by officials of the surface and elevated lines, but are understood to have met with the general approval of Mayor Thompson and the city administration.

Agreement Reached in Pontiac

Negotiations between the city of Pontiac, Mich., and the Detroit United Railway were concluded recently when the City Commission passed an ordinance, tentatively approved by Master in Chancery Sayres of the federal court.

The ordinance provides that the company lay new tracks on Saginaw and West Huron Streets, take up its third track on Saginaw Street, and pave the strip left open; place ten new double-truck cars in operation; abandon the downtown freight station; and deed to the city a strip of land in the center of West Huron Street, extending from Waldo Street to West Boulevard, the west city limits. It also provides that the present rate of fare be maintained. The city in return permits the company to operate its cars on a day-to-day basis, terminable on 30 days notice.

Despite the fact that franchise on some lines expired two years ago, the company has continued to operate its cars on a day-to-day agreement. In view of the settlement it is expected the hearing on the city's petition in federal court asking the receiver to remove the tracks at the expiration of the franchises will be postponed.

Limitations Suggested for Broadcasting by Railways

The Federal Radio Commission does not look with favor on the granting of broadcasting licenses to electric railways where the principal purpose is to provide entertainment for the passengers on their cars. The feeling of the commission is that this service can be furnished effectively by "wired wireless" without further congesting the air. Serious consideration is being given the installation of loud speakers in the cars of electric railways in several cities.

Jersey Transit Body Urges 41st Street Tunnel Extension

Advantages that come to commuters of New Jersey from the construction of the proposed tunnel between the Times Square section of New York to New Durham, N. J., were demonstrated in a report of the North Jersey Transit Commission, made public on June 1. It is said the tunnel, designed to connect with the Interborough tunnel from Queens County, which now has its terminus at 41st Street and Seventh Avenue, would cost $33,000,000.

In connection with the report of probable traffic it was brought out that the commission has under consideration three methods of financing the undertaking. One is a bond issue similar to the plan used in financing interstate bridges; another is by the assessment plan taking into consideration the fares to be received, and the third is private financing with control exercised by some public body such as the Public Utilities Commission of New Jersey or the Interstate Commerce Commission.

The report shows that at the outset the tunnel would carry about 100,000 one-way passengers daily and that by 1945 this total would be increased more than 50 per cent. The report indicated that a competing tunnel to connect with the B.-M. T in West Fourteenth Street was considered. With suburban trains rerouted engineers found that the daily one-way traffic as of 1926 would be 95,508 and in 1945, 152,800. Considering the competing tunnel emergency the total in 1945 comes to 191,800.

It is estimated that the total traffic the tunnel would receive from the railroads would be about 41,437 passengers daily. In addition it would get 54,071 passengers from the ferries and the Hudson Tubes. The average rate of the fare mentioned in addition to the commutation rate has been figured out and ranges from 3.38 cents to as high as 12.65 cents.

Study of Providence Traffic Proposed

A bill has been passed by the Legislature of Rhode Island to create a board to be known as the Providence Thorofare Board in and for the city of Providence to consist of seven persons. This board is instructed by the act that creates it to familiarize itself thoroughly with the Providence traffic and thoroughfare plan approved by the City Council on Dec. 23, 1926, and with that plan as a basis and guide it is to proceed to prepare proposals for carrying out that project.

Broad powers of condemnation were conferred upon the new body. The act also authorizes the City Council of Providence to cause a special tax upon tangible personal property and real estate in the city. The board is to consist of three residents of the city, not members of the City Council, to be appointed by the Mayor, subject to the approval of the Council.

The legislation really has to do with the alleviation of traffic conditions in the city. By City Council resolution approved on April 11, 1925, a committee of the Council was authorized to make a thorough study and investigation of the traffic needs and requirements and their relation to all phases of the physical development of the city and to report to the City Council a comprehensive traffic and thoroughfare plan for the entire city, designed to meet the probable demands of growth and expansion for a long time.

Subsequently by city resolutions approved on June 5, 1925, the committee was authorized and empowered to secure the services of Robert Whitten, New York City, as consultant to assist the committee in the preparation and presentation of a plan of this kind. Mr. Whitten's plan has been referred to previously in the ELECTRIC RAILWAY JOURNAL, particularly the issue of Oct. 23, 1926, page 782, and the issue for Aug. 7, 1926, page 234.

In this connection it is interesting to note that grateful acknowledgment is made by the city planning consultant to the joint standing committee on ordnances of the City Council with respect to the courtesies extended to him by the United Electric Railways, Providence, in supplying data regarded by him as needful in his study, and for the co-operation of the officers of the company in the work which he undertook.

Through Limited Service for Illinois Valley Cities

Through limited service of eight cars daily between Chicago and La Salle, Ill., and intermediate points was started on May 15 by the Chicago & Joliet Electric Railway and Illinois Traction System upon completion of a short track connection in the city of Joliet. The new route, 90 miles long, penetrates the upper reaches of the beautiful Illinois River Valley and provides a fourth through interurban service out of Chicago.

Under an operating agreement between the two lines the Illinois Traction System now runs express cars over the Chicago & Joliet Electric Railway from the Archer Avenue terminal in Chicago to Joliet, thence over its own tracks to Morris, Ottawa and La Salle. The running time of the limited cars is approximately five hours.

Five light-weight, single-end, one-man cars have been remodeled for this service by the Illinois Traction System.

$13,000,000 for Less than a Mile of New York Subway

The city of New York has decided to construct the Nassau Street subway, which has been a point of contention between successive city administrations and the Brooklyn-Manhattan Transit Corporation and its predecessor, the Brooklyn Rapid Transit Company, practically since 1913, when the dual subway contracts were signed. John H. Delaney, chairman of the board, explained that the construction of the line was called for by the dual subway contracts and said it would be the "most expensive, extravagant and useless piece of work ever undertaken by the city." The estimated cost of the line to the city will be $13,000,000 for 4,830 ft. of subway, from the Municipal Building to the entrance of the Whitehall-Montague Street tunnel.

Officers of the company have declared that construction of the line would enable it to increase its service by at least 50 per cent, by relieving the congestion on its lines at DeKalb Avenue, Brooklyn, and by utilizing two now unused tracks on Manhattan Bridge for loop operation.

Municipalization Recommended in Los Angeles

It is the lines of the Los Angeles Railway and not those of the Pacific Electric Railway, the purchase of which is being considered by the city of Los Angeles. This was made plain in a news article in the JOURNAL for May 14, page 877, but in the editorial comment in the same issue the name of the Pacific Electric Railway was inadvertently used. The statement in the JOURNAL further added that the purchase price, according to Dr. Wilcox, should be approximately $30,000,000. This is the figure at which recommendation of purchase has been made by Dr. Wilcox, and refers to the Los Angeles Railway, not the Pacific Electric Railway. The depreciated value of the Pacific Electric Railway is approximately three times this figure.

Eight Cents for James Green in Indianapolis

A finding by the Indiana Public Service Commission has decreed an increase of 8 cents an hour for James Green, an employee of the Indianapolis Street Railway. The decision was rendered in a case in which Green applied to the commission, under the railway contract, for redress of grievances. His pay was increased from 37 to 45 cents an hour. Robert I. Todd, president of the company, said that until he received the official copy of the ruling and had time to study it he could not tell to what extent it would affect other employees.

The order discusses the company contract, conditions surrounding Green's case and its relation to the Indiana Public Service Commission as a board of arbitration. Closer adherence is suggested by the commission to the spirit of provisions of the contract by both the company and the men so that "such difficulties would not arise."

The commission's order applies only to Green. A portion of the order suggests the company re-employ these men as rapidly as vacancies occur.

Green was one of a number of men who went on a strike more than a year ago, when the employees sought an increase in pay. More recently he has been on the extra board for the company.

P.R.T. in New Offices

Executive and general offices of the Philadelphia Rapid Transit Company are now located in the Equitable Building, at the northwest corner of Broad and Locust Streets. Movement of the office equipment and records of the company from the various offices now occupied took place over the week end. The three full days, May 28, 29 and 30, for making a transfer assured against delays of any consequence.

The eleven lower floors in the Equitable Building are to be occupied by P.R.T., while the twelfth floor will accommodate the offices of Mitten Management, Inc. P.R.T. executive offices will be located on the eleventh floor, while the various departments and clerical forces will be housed on the lower floors.

The centralization of the various offices of P.R.T. and its subsidiary companies will make for greater efficiency of operation. Offices of the company located at Eighth and Dauphin Streets, 1520 Spruce Street, Tenth and Luzerne Streets, Fifty-ninth and Callowhill Streets, Liberty Building and the Land Title Building will be vacated.

The lost and found departments of P.R.T. and of the Yellow Cab will be consolidated in the new building within a few weeks. Until this move can be made the lost and found departments of the various locations will continue to operate as at present.

Chamber of Commerce Against San Francisco Extension

Unanimous indorsement of the Spring Valley, Bernal cut and War Memorial bond issues was voted on May 26 by directors of the Chamber of Commerce of San Francisco. The Municipal Railway extension issue was opposed. The bond issues come before the people at the special election on June 14. The directors of the chamber urge the three first issues as a "progress measure." On the railway issue they said:

> We regret exceedingly that the voters have not been permitted to vote separately on the different street railroad projects, so that meritorious extensions could be approved without at the same time committing the city to unbusiness-like and impractical extensions, which would be a severe drain upon its resources.

Attention is called to City Engineer O'Shaughnessy's original recommendations for extensions costing $2,850,000. The difference between that sum and the $4,700,000 bond issue to be voted upon is said to be the cost of the "unnecessary and unprofitable extensions." The statement continues:

> If the people were to defeat the propose drailway extension bond issue, the city will be able later to submit a subsequent series of bond propositions for extensions, and though resulting in delay would not be as serious as the proposed reckless waste of the people's money.

Trial of Short-Haul Five-Cent Fare in Seattle

A short-haul 5-cent fare system will be tried out by the Seattle Municipal Street Railway, Seattle, Wash., in the downtown district, if plans which D. W. Henderson, superintendent, has recommended to the City Council, with the approval of Mayor Bertha K. Landes, are authorized by that body. Mr. Henderson asks the Council for permission to try the reduced fare plan for 60 days, beginning July 1. The plan provides for a loop route, with shuttle cars furnishing the service operating on a loop system. The fare will be 5 cents without transfer privilege. Passengers requiring transfer to through lines will be required to pay the full fare, 10 cents cash or 8⅓ cents token rate. Shuttle cars will be painted a distinctive color, so they will not be mistaken for through cars, and operation of cars on through lines now running through the business district will not be discontinued.

Mr. Henderson believes the plan will increase the railway's revenues by promoting use of the street cars for short trips in the business section. The plan has been discussed thoroughly with Mayor Landes, who believes it is worth a trial. Mr. Henderson has also asked the City Council for legislation which will make possible operation of express cars on the recently rebuilt Westlake Avenue North line. He requested authority to purchase two auto buses, for use in handling purely local traffic on Westlake Avenue North.

Rates to Be Revised.—The Conestoga Traction Company has filed with the Pennsylvania Public Service Commission at Harrisburg a revision of its passenger rates which will apply to both city and suburban lines in Lancaster County. The new rates will be slightly higher to the occasional rider who pays a cash fare of 7 cents. About the same fare will be charged to semi-regular riders who buy four tickets for a quarter, and will be considerably lower to those who ride regularly and who buy a weekly pass good for an unlimited number of rides for $1.10. The cash rate now is 6 cents.

New Wage Scale in Indianapolis.—By an agreement between John P. Tretton, superintendent of the Indianapolis Street Railway, Indianapolis, Ind., and a committee of thirteen men representing railway and bus employees, a new schedule of pay, increasing wages of these men 3 cents an hour, became effective on June 1. The scale approved at the meeting is the same as that fixed in an order by the Indiana Public Service Commission. The increase applies to all of the men who operate buses or street cars. The new minimum scale is 40 cents an hour and the maximum 45 cents.

Makes Suggestions for Traffic Control.—For the regulation of traffic on Olive Street, St. Louis, Mo., when that thoroughfare is widened between Twelfth Boulevard and Channing Avenue, Reyburn Hoffmann, traffic engineer, in his annual report to Director of Streets and Sewers Brooks, has recommended that only nine street car stops be allowed on Olive Street between Grand Boulevard and Twelfth Boulevard. Mr. Hoffmann predicts that Olive Street will become the main East and West traffic artery of the city and in order that street cars and automobiles may move swiftly and safely he believes that the number of car stops should be reduced to a minimum. His arrangement would allow street cars a speed of 15 m.p.h. and automobiles 20 m.p.h., on the average. Automatic traffic signals would be synchronized.

Fare Reduction Hearing Refused.—The Public Utilities Commission of the District of Columbia refused on May 26 the request of the Public Utilities Committee of the Federation of Citizens Associations that a public hearing be held on reduction of car fares for school children, sale on cars of three tokens for 20 cents and issuance of universal transfers. It claimed that neither the Capital Traction nor the Washington Railway & Electric is earning a fair return on its investments. The commission said that a public hearing on these questions would be inappropriate in view of the restricted income of the companies, inasmuch as two of them would amount to fare reductions, which would still further reduce the companies' income. Nevertheless, the commission ruled, if a public hearing should be called on any other question affecting either of the companies in the near future, the federation's suggestion in the call would be considered.

New Pamphlet Appears.—The first issue of the *Indiana Service News* appeared under date of May, 1927. It will be published monthly by the Indiana Service Corporation, Fort Wayne, Ind., with a threefold purpose. First, the company desires that there be some channel for giving employees news which cannot be issued in bulletin form, the second desire is to have a means by which each employee may learn what the company as a whole and in its various departments is doing, and, lastly, it is thought that the publication will acquaint employees with each other, and by cultivation of friendship increase the company's success.

Recent Bus Developments

Hearing to Be Held on Indianapolis Bus Purchase

The Indiana Public Service Commission is to conduct a hearing shortly in connection with the recent proposal by the Indianapolis Street Railway, Indianapolis, Ind., to purchase the stock of the Peoples Motor Coach Company for $500,000. The original petition was refused some time ago. The petition for rehearing was supplemented by an intervening petition signed by approximately 100 residents of the city, asking the commission to hear the case again.

The petition states that the commission erred in its method of determining the value of the coach company. The new petition offers no alteration in the proposed price of $500,000, which the commission held to be too high, but points out again that savings which would result through co-ordination of operation and elimination of duplication would be $117,000 a year. To the objection of the commission that 8 per cent interest on the notes to be issued by the purchasing company to pay for the property is too high, the petition points out that even this method would save $21,000 over the alternative one of selling a lower interest bearing security at a discount.

Gary Railways Would Abandon Express Motor Coach Route

Application for authority to discontinue motor coach service over a 6-mile route on Broadway, the main business street of Gary, Ind., was made to the Indiana Public Service Commission on May 31 by the Gary Railways. In maintaining an hourly, limited-stop express service on this line between outlying residential sections and the downtown business center, the company's petition states, an average daily operating loss of $50 has been incurred since the service was started April 18. It is alleged that the number of passengers per trip has seldom exceeded ten and that the average is only 2.7. Although a luxurious type of parlor motor coach equipment has been used in this service, failure of the line to do a paying business is attributed by officials of the company to intense private automobile competition and to the fact that a more frequent service is provided over a large portion of the route at a lower fare by the company's street cars.

Bus Expansion in Westchester

The Public Service Commission granted on May 31 the petition of the New York & Stamford Railway for approval of a declaration of abandonment of portions of its line in the village of Rye and the town of Mamaroneck, Westchester County, N. Y. This petition is part of a general plan of the railway to substitute buses for railway service in parts of its territory. Trolley service in Port Chester has already been abandoned and bus service substituted and permission was given on May 31 by the commission for bus service in Mamaroneck and Larchmont. This petition is for the abandonment of service in Larchmont and Rye by railway and the substitution of bus service. A petition for a certificate for operation of buses in Rye has not been acted upon because the company and the village authorities have not agreed upon the most feasible route.

Testimony at the hearings showed that the Rye Beach line and the Larchmont Manor railway lines had not paid operating expenses for a considerable period of time, and in an effort to minimize its loss as much as possible the company has adopted the policy of substituting buses on certain portions of its trolley lines.

The company is desirous of acquiring the capital stock of the County Transportation Company, Inc., which recently was granted permission to operate bus lines in the villages of Mamaroneck and Larchmont.

New Deal Likely in Miami

Final Argument Heard on Jitney Elimination—New Contract Between City and Company Suggested—Mayor Favors Eliminating Jitneys

FURTHER continuance of the jitney bus drivers' injunction suit against the city of Miami, Fla., was ordered recently by Circuit Judge H. F. Atkinson when Bart A. Riley, counsel for the jitney owners, named the Miami Beach Railway co-defendant in the action. Counsel for the railway asked for the continuance in order to prepare its case. The final hearing will now be held on June 10 instead of May 25 as originally set.

The suit was brought several months ago to restrain the city from enforcing a new transportation ordinance that would rule small automobiles operated for public hire from the downtown streets. Charges of a conspiracy between the city and the railway were made. Circuit Judge Atkinson referred the action to H. H. Eyles, general master, for sifting of the charges. The testimony was returned to the court recently. Although the city's bus contract with the railway was attacked in the bill, the railway was not named a defendant until a few days ago.

Miami's passenger transportation ordinance was scheduled to go into effect on Feb. 3. Immediately after its passage, however, the measure was attacked in a suit brought in Circuit Court by C. H. Wood, jitney bus driver, who represents 160 other persons engaged in the jitney bus business, requesting that the court prevent the city from enforcing the act.

Besides asking for temporary and permanent injunctions against the city, the bus drivers through their bill ask that the ordinance be declared a violation of the constitution of the United States and the bill of rights of the state of Florida; that the city be further enjoined from illegally expending any of the moneys of the city for the benefit of any private corporation; that the defendants be restrained from combining and confederating together with any person, firm or corporation for the purpose of restraining the transportation of persons for hire in the city, and other relief.

The city's contract with the Miami Beach Railway, a subsidiary of the Florida Power & Light Company, is attacked in the petition and declared to be illegal. It is charged that the City Commissioners have surrendered their law-making power in the contract and have bound the city to unlawful things. According to the jitney drivers the purpose of the new bus ordinance is to break down competition between jitney drivers and the Miami Beach Railway, which operates both cars and buses, all of which have seating capacities of more than fifteen persons each. It was further charged that the city in securing passage of the measure was motivated by a contract with the Miami Beach Railway which guarantees the company a minimum income in the operation of buses.

To this the commission answered that there was an oversupply of transportation in Miami which, in addition to increasing traffic congestion, was costing the taxpayers a considerable amount that could be materially reduced or eliminated entirely under a new system. The commission conceded, however, that the ordinance would work a hardship on present jitney operators and expressed a willingness to minimize this as far as the public interest would allow.

In this connection the Mayor said that for some time he had been in favor of an ordinance to prevent operation of jitneys, but denied that a conspiracy existed, or that the city authorized money for purchase by the railway of jitney bus drivers' rights. In referring to the railway's practice in buying up the rights, the chief executive said:

> I though they should give the jitney owners something. They didn't have to do it. I was glad to see it done because these boys had some investment and had suffered losses. There is too much traffic congestion downtown.

According to him, adequate transportation was the greatest need of the city when the contract was entered into with the railway. He told how transportation increased property values by making outlying sections accessible. This, he said, the railway was doing by operating buses in territory that was not as renumerative as other sections of the city.

Ever since the municipal bus service started more than a year ago, two problems have been involved in Miami's transportation situation. One was the demand of thousands of home owners and citizens that adequate and dependable transportation be furnished in all sections of the city at reasonable rates.

The other was that if such service was furnished its cost would probably be reflected in taxes.

The Miami Beach Railway is understood to have agreed to meet the City Commission half way or more on any reasonable proposal with respect to the modification of the operating arrangement between them, even to the probable extent of canceling its present charge against the city and trusting to the future prosperity and population of the city to overcome the deficit.

Under tentative plans the railway would continue to operate buses, but in a competitive field and without any guarantee against losses. The company also is under contract to operate the railway system in Miami on terms which prohibit it from charging more than a 5-cent fare. In return for the minimum fare guarantee the city leases its railway equipment to the company on a sliding rental scale, $3,500 for the year 1927, $4,500 for 1928 and $5,500 for 1929. The company maintains the transit lines and equipment, but the city is found to furnish new cars as needed.

A portion of the plan under consideration is an arrangement whereby the city would waive its annual lease charges and in turn be released from the purchase of new cars. The company would then link its railway and bus transportation into a unified system, maintaining both, furnishing all replacements and operating on a virtually independent basis. At present both the railway system and the bus service are operating at a loss, the records show.

Buses Not Sources of Revenue on Lincoln Interurban

Supporting his request for permission to abandon three buses as supplementary to his cars, J. M. Bramlette, general manager of the Omaha, Lincoln & Beatrice Railway, testified before the State Railway Commission that his experience with buses had been disastrous. The company put the buses in service on Oct. 19, 1926. The operating expenses per bus-mile up to May 1 were 20.12 cents, while the gross revenue was 18.27 cents, a loss of 1.85 cents. As drivers' wages were increased 5 cents an hour on May 1 the deficit was increasing, with the slack period approaching. Gross revenue for the period was $14,590, while operating expenses were $16,065.

Mr. Bramlette testified that the cost per bus-mile was favorably affected by the fact that he was general superintendent and general foreman as well as general manager. As a substitute for part of the bus service, which was largely competitive with the company's cars, he would speed up service between Lincoln and University Place during peak hours and would give through service instead of shuttle service run before the buses were installed.

The company desires to abandon Fourteenth and O Streets, Lincoln, its downtown terminus for many years, and to run its cars largely on the rails of the Lincoln Traction Company around a loop that keeps it off the main business street, but touches the shopping, hotel and theater districts.

Financial and Corporate

Control of Washington-Baltimore Road in New Hands

Application to take over the controlling interest, or 54 per cent of the stock, of the Washington, Baltimore & Annapolis Railroad through the medium of a holding company has been made to the Maryland Public Service Commission by the Consolidated Gas, Electric Light & Power Company, Baltimore. The commission has set June 3 as the date to hold a hearing on the application.

The petition filed with the Public Service Commission states that the shares the Consolidated plans to take over are held by Aldred & Company, New York bankers, who are prepared to sell at $1,135,802 cash.

Charles Markell, attorney representing the Consolidated, filed the petition with the commission. The holding company, known as the Baltimore Corporation of Maryland, filed a certificate of incorporation with the State Tax Commission shortly before the application was made to the Public Service Commission. The directors of the holding company will be members of the board of the Consolidated, which includes Herbert A. Wagner, Charles M. Cohn, Charles E. F. Clarke, John L. Bailey and F. W. Wood.

Under the terms of the plan submitted to the Public Service Commission the holding company would issue 45,433 shares of capital stock without par value, to be acquired later by the Consolidated for $1,135,825. Approval also is asked for the acquisition by the holding company of 18,148 shares of Washington, Baltimore & Annapolis preferred stock and 32,429 shares of common stock.

If the Consolidated obtains control of the railway it also will, at the same time, acquire the subsidiary companies operated by the electric railroad. These are the Annapolis & Chesapeake Bay Power Company, which serves a large territory between Baltimore and Washington; the Terminal Real Estate Company and the Maryland Development & Realty Company of Anne Arundel County.

The total mileage operated in 1926 by the railway was 147, with total car-miles of 4,479,856. Operating revenue, including the subsidiaries, totaled $2,564,047.29.

New Charter Sought for Old Cincinnati Line

The first step toward taking over the old Cincinnati, Georgetown & Portsmouth Railroad was made recently when the Cincinnati, Georgetown & Portsmouth Railroad applied for a charter at Columbus, Ohio. The road recently was sold at receiver's sale under direction of the Common Pleas Court and was bid in by J. P. Longon at $225,000. Capital of the new concern consists of 500 shares of no par value stock. The Cincinnati, Georgetown & Portsmouth is a 42-mile interurban connecting Cincinnati with Georgetown, Ohio. Indications are that operation will continue under control of new owners.

Reduction in Corporation Income Tax Urged

A specific demand for the reduction of the corporation income tax, backed by the business interests represented in the 1,500 member organizations of the Chamber of Commerce of the United States, will be made upon the new Congress when it assembles next December. This move was decided upon at a meeting of the special committee on taxation of the chamber, meeting in Washington.

A reduction of the corporation income tax rate to 10 per cent from the 13½ per cent rate now in force will constitute the main item on the business program for tax revision. Such a reduction, it was asserted, should be made even if it were to involve a deficit at the end of the fiscal year, on the ground that the imposition of so heavy a burden upon productive enterprise is wrong in principle and retards the economic development of the country.

According to the present outlook, the committee believes a lowering of the rate will not lead to a shortage in the government's income. It is expected that the Treasury's books on June 30 will show a surplus of $450,000,000, while the 3½ per cent reduction in the corporation income tax would amount to approximately $325,000,000, leaving a margin of $125,000,000 for reductions in other directions, such as the repeal of the federal estate tax and the war excise taxes on particular business.

Earnings in Tennessee Increase

The gross earnings of the Tennessee Electric Power Company, Chattanooga, Tenn., for the year ended Dec. 31, 1926, included transportation earnings of $3,284,487, against $3,258,165 for the year previous. This figure includes operations by the Nashville Railway & Light Company and other subsidiaries of the Tennessee Electric Power. The annual report to the stockholders states that approximately 27 per cent of the gross earnings was derived from the transportation business. During the year the transportation systems in Nashville and Chattanooga carried 45,615,025 passengers, a gain of 125,034 passengers over 1925. Comparative figures showing the revenue passengers carried during the past five years are as follows:

1922	45,680,057
1923	45,929,865
1924	45,057,283
1925	45,489,991
1926	45,615,025

In order to improve service to the public, the company and its subsidiaries expended $7,385,889 in 1926. Of this amount approximately 12 per cent was used in the transportation department. This included the purchase of 20 modern light-weight, double-truck, one-man, two-man operated rail coaches, of which ten were placed in operation on the Nashville and ten on the Chattanooga city transportation systems.

During the year the capital structure of the company was simplified and additional money received through issue of common stock, practically all of which was purchased by the Commonwealth Power Corporation. The company sold during the year a net total of $1,770,100, par value, of first preferred stock on the customer-ownership plan. At the close of 1926 the total amount of preferred stock subscribed on the monthly payment plan was $897,000, par value, on which $608,350 remained to be paid in 1927 by the subscribers.

New Jersey Subsidiaries Report Gain

Public Service Rail and Bus Passengers Show Increase of 34,000,000—Maintenance Work Continues—Progress Noted in Co-ordinated Rail and Bus Service

OPERATING revenues of subsidiary companies of the Public Service Corporation of New Jersey for the twelve months ended Dec. 31, 1926, were $106,303,209, against $94,715,525 for the year previous. This was disclosed in the eighteenth annual report, which shows a net increase in surplus of $2,666,318 after payment of dividends of $6,067,033 on the common stock of the Public Service Corporation of New Jersey. For each of the quarters ended March, June and September $1.25 per share was paid on the common stock. An exchange of the common stock on the basis of three shares for each share outstanding was made during October, and for the quarter ended Dec. 31, 1926, a dividend of 50 cents a share was paid.

Readers of the ELECTRIC RAILWAY JOURNAL, though interested in all operations of the New Jersey system, are especially concerned with the transportation properties, which serve 188 municipalities housing 2,493,564 people. Thus the figures in the accompanying tables reflect primarily activities in the bus and railway fields.

NEARLY 600,000,000 PASSENGERS TRANSPORTED

The number of passengers carried on Public Service cars and buses in 1926 was 597,330,872, exceeding by more than 34,400,000 the number carried in 1925. This increase reflects to some extent business added through purchase of additional lines and buses before operated by independent owners, but at the same time demonstrates a satisfactory increase in riding throughout the territory served. Progress is reported in the co-ordination of street car and bus service, and the result shows in the more favorable financial statements of Public Service Railway and the Public Service Transportation Company. The task is, however, by no means complete and can be fully accomplished only by greater co-operation from state and municipal authorities than has yet been extended. The complete situation as it affects the public and the companies was put before the State Board of Public Utility Commissioners in a petition filed with the board on Dec. 14, in which specific suggestions for relief were made.

On Sept. 13 a wage agreement between both car and bus employees, members of the Amalgamated Association. was signed, which, with some slight modification, keeps in force for a period of three years from Oct. 1, 1926, the rate of wages and working conditions that had been in effect since Oct. 1, 1923.

STATEMENT OF MILEAGE OF THE PUBLIC SERVICE RAILWAY AS OF DEC. 31, 1926

			Miles
First main track			536.122
Second main track and turnouts			296.287
Connections, crossovers, wyes and loops			12.090
Carhouse and yard tracks			46.186
Total			890.685
Total number of passenger cars available for operation:	Closed—1,854	Open—277	
Number of new passenger cars since 1903:	Closed—1,493	Open—327	
			Miles
Track reconstructed with new rail during 1926			13.395
Track reconstructed with same rail during 1926			1.631
Extensions built during 1926			2.173

On Dec. 3, 1926, a "no accident bonus system" was made effective for car and bus operators, under the terms of which each operator receives $1 for each week in which his accident record is clear and a total of $60 for a 52-week clear accident record.

The report states the property of Public Service Railway has been well maintained during the year and a number of improvements made for the betterment of service. The most notable of these was the extension of track in Washington Street, Newark. In connection with the Washington Street track extension, a passageway was opened along the subway, between Washington and Halsey Streets, to give access to west-bound cars having their terminus in Public Service Terminal and a station was constructed in the subway for east-bound passengers, which gives access through the Kresge department store building to the west side of Broad Street.

More than 13 miles of track was reconstructed with new rail during the year and 1.63 miles with old rail. Track extensions of 2.17 miles were made.

A total of 693 cars were completely overhauled, 1,541 received general repairs, 858 were painted, 30 additional cars were converted for one-man operation and snow scrapers were installed on 349 cars.

The scope of Public Service Transportation Company's operations was materially enlarged during the year by the taking over of independent lines and buses and by the starting of new lines. In addition to the purchase of individual buses on a number of lines, the company took over entirely on May 3 the Arrow bus line, operating between Newark and Paterson, and on May 7 the Peters bus line, operating between Elizabeth and Rahway. On Jan. 15 the River Road line of buses was put in service between George Road and the Edgewater-Fort Lee boundary line. On Jan. 24 the High Street line was put in operation between Bloomfield Avenue and High Street and the Produce Market, Newark. On April 26 the Bergen bus line was put in operation between Hackensack and the Weehawken ferry and on Dec. 27 the Edgewater line was put in operation between Ridgefield and Edgewater.

Bus equipment of the company was greatly improved during the year. After careful investigation of various types, 395 gas-electric buses were purchased and substituted for unsatisfactory equipment taken over, or put into service on new lines. Bodies for 189 of these buses were built in Public Service shops.

A large amount of construction and

TRANSPORTATION STATISTICS CONTAINING OPERATIONS OF PUBLIC SERVICE SYSTEM IN NEW JERSEY

Year	Trolley Passengers	Bus Passengers	Total	Trolley Mileage	Bus Mileage	Total	Trolley-Hours	Bus-Hours	Total	Passenger Receipts per Trolley-Mile in Cents	Passenger Receipts per Bus-Mile in Cents
1917	476,974,983	....	476,974,983	56,087,403	....	56,087,403	6,021,225	....	6,021,225	32.44	.....
1918	451,220,806	....	451,220,806	54,039,150	....	54,039,150	5,698,089	....	5,698,089	36.00	.....
1919*	396,689,234	....	396,689,234	57,644,927	....	57,644,927	6,039,453	....	6,039,453	39.29	.....
1920	453,534,694	....	453,534,694	60,798,743	....	60,798,743	6,539,207	....	6,539,207	43.21	.....
1921	435,679,801	....	435,679,801	58,309,883	....	58,309,883	6,212,276	....	6,212,276	44.11	.....
1922	410,212,814	....	410,212,814	56,419,982	....	56,419,982	5,983,122	....	5,983,122	45.59	.....
1923	354,194,933	1,952,059	356,146,992	49,272,078	505,322	49,777,400	5,206,092	60,663	5,266,755	42.75	22.43
1924	427,828,444	69,383,643	497,212,087	53,945,515	15,704,663	69,650,178	5,662,340	1,928,498	7,590,838	41.04	26.13
1925	416,788,621	146,053,237	562,841,858	50,115,119	27,506,493	77,621,612	5,402,008	3,273,801	8,675,809	41.32	27.41
1926	397,690,308	199,640,564	597,330,872	45,632,230	36,082,405	81,714,635	4,929,558	4,013,602	8,943,160	42.85	30.05

* Mile zone system in effect from Sept. 14 to Dec. 7.

repair work on equipment was also done by the company. Two hundred and seventy-six buses were completely overhauled, 1,248 partially overhauled, 389 new bus bodies painted, in addition to the repainting of 366, and 652 gas engines, in addition to those in overhauled buses, were rehabilitated. Besides substantial additions were made to the garage and terminal equipment of the company.

In the matter of rates the report states that on Dec. 14, 1926, Public Service Railway and Public Service Transportation Company presented to the board a joint petition for relief, in which the financial and operating conditions of the two companies were set forth and a number of suggestions made for public co-operation in the adoption of measures which would either increase the revenue or decrease the expenses of the companies sufficiently to obviate the necessity of a general increase in rates. The changes in rates were to be effective on Jan. 1, 1927, but the Utility Board suspended them for three months and set them down for hearing on Jan. 19, 1927.

INCOME ACCOUNT OF THE PUBLIC SERVICE RAILWAY AND SUBSIDIARIES FOR THE TWELVE MONTHS ENDED DEC. 31, 1926

	Public Service Railway	Public Service Transportation Company	Public Service Railroad	Other Affiliated Companies	Total
Operating revenues................	$19,974,905	$10,944,443	$283,513	$1,859,736	$33,062,600
Operating expenses................	$9,506,463	$6,124,297	$71,700	$698,765	$16,401,226
Maintenance.......................	2,828,664	2,884,287	59,732	75,286	5,847,971
Taxes..............................	2,181,887	608,665	46,342	177,277	3,014,174
Depreciation.......................	801,113	1,094,962	....	167,500	2,063,575
Operating revenue deductions.....	$15,318,129	$10,712,213	$177,775	$1,118,829	$27,326,948
Operating income.................	$4,656,776	$232,230	$105,738	$740,907	$5,735,652
Non-operating income (exclusive of dividends of affiliated companies)	150,058	7,867	1,137	25,093	184,157
Gross income.....................	$4,806,835	$240,098	$106,875	$766,001	$5,919,809
Income deductions (bond interest, rentals and miscellaneous interest charges)........................	4,917,136	152,580	130,347	63,414	5,263,480
Net income or loss.................	†$110,301	$87,517	†$23,472	$702,586	$656,329
Profit and loss accounts (excluding dividends)......................	*22,046	1,921	*7,974	1,539	*26,559
Surplus (before dividends)........	†$88,255	$85,595	†$15,498	$701,046	$682,888
Intercompany dividends............	*324,574	....	....	324,574	....
	$236,318	$85,595	†$15,498	$376,472	$682,888
Dividends paid unaffiliated interests (directors)......................	....	....	....	226	226
Net increase or decrease in surplus	$236,318	$85,595	†$15,498	$376,246	$682,662

* Credit. † Deficit.

The operating revenues of subsidiary transportation properties of the Public Service Railway are as follows:

1917	$19,394,025	1922	$27,544,509
1918	20,831,762	1923	23,105,003
1919	24,140,356	1924	28,257,177
1920	27,882,095	*1925	30,517,918
1921	27,404,867	1926	33,062,600

* Change in classification of accounts effective Jan. 1.

Foreclosure Sale in St. Louis Deferred Until Aug. 1

The absence of a qualified bidder for the properties of the United Railways, St. Louis, Mo., has resulted in a postponement of the foreclosure sale until Aug. 1, according to an announcement of Special Master William L. Igoe. The postponement was anticipated because of the failure of the city administration and the St. Louis Public Service Company to agree on a new franchise and also because of the pending proceeding before the Missouri Public Service Commission on the application of Receiver Rolla Wells for an 8-cent fare. The St. Louis Public Service Company has practically completed its financial structure for the purchase and operation of the system, but will probably await the disposition of the franchise and the fare questions before bidding in the properties.

Easements Case Put Over.—The Maryland Public Service Commission has postponed the hearing on the easements valuation case of the United Railways & Electric Company, Baltimore. The case was scheduled to be heard on May 26, but was postponed because of the inability of one of the legal representatives of the United to attend. The date for the heaving has not been set.

Texas Acquisition Rumored.—It is reported that the Eastern Texas Electric Company, a Stone & Webster property, operating in Beaumont, Tex., is to take over the Port Arthur Traction Company, provided the franchise situation is worked out satisfactorily. The Port Arthur Traction Company operates 7 miles of line in Port Arthur, Tex.

Amends Part of Receivership Decree.—In order to correct an error, Federal Judge Faris of St. Louis, Mo., on May 26 modified his decree in the United Railways receivership case so that interest on claims should not be paid for the period after the institution of the receivership suit in 1919. The original decree provided for the payment of interest to 1926. The error was caused by the attorneys overlooking numerous court decisions which held that interest on claims stopped with the appointment of receivers.

Would Abandon Tracks and Sell Certain Properties.—The Pacific Electric Railway has applied to the California Railroad Commission for authority to abandon and remove its tracks on Third Street and Broadway in the city of Santa Monica, and also for authority to sell certain property along its Huntington Beach Line in the city of Huntington Beach.

Objects to Track Removal.—A number of the city officials and citizens of Watertown, Wis., appeared before the Railroad Commission to protest against the abandonment of railway service in Watertown. The City Council has granted the Milwaukee Electric Railway & Light Company permission to remove tracks in connection with the company's $100,000 rapid transit improvement program, which includes provision for local service over interurban lines only. The commission took the case under advisement.

Would Abandon Part of Line.—Application was made to the Public Service Commission on May 20 by the Geneva, Seneca Falls & Auburn Railroad, Inc., and L. S. Hoskins and James M. Ryan, as receivers, for approval of a declaration of abandonment of part of its line in Seneca Falls, N. Y. The company alleges that this part of its line is no longer necessary or convenient to the public.

Defunct Line Bought.—Eleven miles of steel rails and other track equipment of the Murphysboro & Southern Illinois Electric Railroad were bought at receiver's sale recently by the Sonken-Galamba Corporation, Kansas City, which will sell the material as scrap. The line was built during the war at a cost of $300,000 and operated between Murphysboro and Carbondale, Ill. In later years a hard-surfaced highway paralleling the railway brought about a reduction in the passenger business until the road eventually went into receivership.

Abandonment Case Reheard.—Rehearing of the application of the Niles-Mineral Ridge branch of the West End Traction Company, Columbus, Ohio, to suspend operations was completed before the State Public Utilities Commission on May 23. The commission will conduct a further examination before making any decision. The Trumbull County Commissioners agree to withdraw an assessment of $60,000 against the company for use of a viaduct. It was this assessment which was advanced by the company as a reason for wishing to cease operations. Paul Z. Hodge, City Solicitor of Niles, and William McLain, Warren, Assistant County Prosecutor of Trumbull County, were strong in their advocacy of the continuation of service.

Would Purchase Leased Line.—The Capital Traction Company, Washington, D. C., informed the Public Utilities Commission of the District of Columbia on May 25 that it had entered into a contract with Charles Selden, owner of the capital stock of the Washington & Maryland Railroad, for purchase of the company for $98,000. This is contingent on the approval of the commission and of the Public Service Commission of Maryland. The line about to be purchased runs from Fourteenth and Kennedy Streets, N. W., to Takoma Park, Md. It has been operated by the Capital Traction Company under lease for many years. It is proposed by the Capital Traction, after buying the line, to run cars only to Third and Kennedy Streets, N. W., and from that point operate buses to Takoma Park.

Legal Notes

CALIFORNIA—*Last Clear Chance Doctrine Not Considered Applicable.*

In a pedestrian's personal injury action against a street car company, last clear chance doctrine is inapplicable, if motorman did not see the plaintiff, since such doctrine is based on the fact that defendant, knowing of plaintiff's danger, had opportunity to avoid the accident. In determining the speed of an electric train, in a personal injury action, the jury could consider the fact that the noise and rumble of a three-car train would accentuate the idea of speed entertained by many people, and that their testimony might not be so reliable as that of the motorman, notwithstanding that the latter might be classed as an interested witness. [Tolkover vs. Pacific Elec. Ry., 254 Pac., 926.]

ILLINOIS—*Defines City's Part in Relocation of Tracks of Street Railway.*

In proceedings to require street railways to remove tracks to center of street, where street was to be widened on one side, because widening and track removal were necessary for public convenience, the fact that commissioner, under ordinance, had approved old location of tracks did not estop city to require that tracks be relocated. This is the ruling since the ordinance provided that nothing therein should be construed to deprive the city of police power. [People vs. Chicago City Ry., 155 N. E., 783.]

KANSAS—*Negligence of Driver of Auto Blamed for Collision with Street Car.*

A street car was struck by an auto in which plaintiff was a passenger, at a point 4 or 5 ft. from the rear end. The testimony of the driver of the auto was that he was driving in low gear at not more than 10 miles an hour and could have stopped his machine in 6 ft. The trolley car was 35 ft. long. The driver of the auto saw the street car before the collision and had observed its movement. In view of the above, it was held that the company could not be held liable and that the driver of the auto was clearly negligent. [Mallory vs. Fleming, 253 Pac., 1090.]

MARYLAND—*Only at Certain Times Does Accumulation of Snow and Ice on Steps Mean Negligence.*

Plaintiff was injured while alighting from an electric interurban train. She claimed that the accumulation of snow and ice on the steps had made them slippery, causing her to fall; that the carrier at times cut off the snow and ice from the steps before the passengers were discharged, but that it did not do so on the occasion in question. It was held that it is unquestionably the general rule that to require a railroad operating its trains through a storm to keep its platforms and approaches free at all times from ice and snow would impose upon it an unreasonable and impracticable burden, which would seriously interfere with the adequate and efficient discharge of its duty as a common carrier; but that it is also true that when the carrier has a reasonable opportunity to discover and correct unsafe conditions caused by the deposit of ice and snow on the steps, platforms and other approaches to its cars, and fails to do so, it is negligent. [Washington, Baltimore & Annapolis Elec. R. Co. vs. Fitch, 136 Atl., 529.]

MASSACHUSETTS. — *Responsibility for Injuries Sustained by Passenger Discharged at Irregular Stopping Place.*

Decedent was discharged from a street car at an irregular stopping place, in a parkway, where snow was packed near the tracks. He crossed over the outbound tracks and was walking on the inbound tracks when he was struck by a car traveling on those tracks. The operator of the outbound car and two others testified that they looked and saw no inbound car approaching. The court held that decedent was not a trespasser as to the railway and it was presumed that he exercised due care; that in view of the above testimony a jury question was presented as to his contributory negligence. [Poppell vs. Boston El. Ry., 155 N.E., 267.]

MISSOURI—*Duty of Person Approaching Tracks Defined.*

A person nearing street railway tracks is in duty bound to listen and look in both directions for cars, providing looking or listening would enable him to discover their approach, and failure to do so is contributory negligence. [Hoodenpyle vs. Wells, 291 S. W., 520.]

NEW JERSEY.—*An Injunction Granted Against Objectionable Parking.*

An injunction was allowed a tenant of a property against a bus owner who parked his buses in the street in front of the leased premises and whose drivers molested complainant's customers and whose starters drove complainant's customers away, causing loss of business, customers and profits. [Livingston vs. Stoddard, 136 Atl., 205.]

NEW JERSEY—*Evidence of Intoxication in Collision Admitted.*

In an action by an auto passenger against a street railway for injuries received in a collision between the auto and a trolley car, evidence as to whether the plaintiff and the owner of the auto were drunk at the time of the accident was held admissible. [Damchuk vs. Public Service Ry., 136 Atl., 604.]

NEW YORK—*Rules on Operating on Routes of Other Companies.*

Use by a street railway corporation of another's route, whether as coadventurer, principal or licensee, necessarily involved agreement between corporations for use or operation by one of franchises of other, is prohibited by public service commission law. [Berkey vs. Third Avenue Ry., 155 N. E., 914-88.]

OHIO—*When Good Will of Business Is Credited.*

A certificate of convenience and necessity to operate a motor bus line over a portion of the public highways is neither property nor a business, and good will does not attach thereto; nor does operation over the public highway under such certificate entitle the holder thereof to credit his capital assets with any sum for good will or going concern. [Penn. R.R. Co. vs. P. U. Comm. of Ohio, 155 N. E., 695.]

RHODE ISLAND—*Convenience Necessity Is Determined by Commission.*

In passing upon public convenience and necessity, the commission must consider whether a proposed route is suited to and tends to promote the accommodation of the public and also whether it is reasonably required to meet a need for such accommodation. It is justified in considering the existing means of transportation as to its substantial character and its probable permanence, also the investment of capital made by the owners of such existing means, the nature of the service that is being rendered, and, if such service is adequate, what will be the probable effect of meeting competition into a field now adequately served, and what effect such competition will probably have upon the receipts of existing lines of transportation, and as to whether, in the face of further competition, the adequacy of the existing service will be continued. In this case the findings of the commission that the service of the electric trolley and steam railways was sufficient were affirmed. [Abbott vs. P. U. Comm., 136 Atl., 490. See also Columbus Ry., Power & Light Co., vs. P. U. Comm. of Ohio, 155 N. E., 647.]

TEXAS—*Adult Standee Near Track Needs No Warning of Car Rounding Curve.*

Plaintiff alighted from a street car and stood near the tracks, where she was struck by the car as it swung around a curve. It was held that after she alighted from the car and was standing on the pavement she was no longer a passenger and the company did not then owe her the duty of carrier and passenger; that the motorman may assume that an adult person, standing near the track, apparently able to see, hear and move, and having notice of the approach of the car and the existence of the curve, will avoid being struck as the car swings around the curve, and has no legal duty to warn such person of possible danger because of the swing. [El Paso Electric Co. vs. Ludlow, 291 S. W., 619.]

WASHINGTON—*Surrender of Franchise —Return of Deposit.*

In the case of a city purchasing a street railway under an ordinance, it was held that the city was not entitled to the emergency fund deposited under franchise, where the sale constituted the surrender of franchise, since the purpose of the deposit having ceased, the fund became a chose in action, to which city had no defense under the exception which applied to personal property. [Puget Sound Power & Light Co. vs. City of Seattle, 253 Pac., 1083.]

Personal Items

Cincinnati Car Company Officials

Reviews of Careers of Men Changed in Status Following Death of W. Kesley Schoepf

Henry L. Sanders, former vice-president of the Cincinnati Car Company and now president of that company, worked side by side with W. Kesley Schoepf up to the day of the untimely death of that powerful and successful leader. He began his association with the Schoepf companies in 1905, as assistant purchasing agent. Mr. Sanders' education did not include college training. He entered the transportation field in 1893, in the accounting department of the Atlantic Coast Line Railway. When the Spanish-American war broke out he left this position to serve his country in the navy. He was made a pay clerk and was given charge of the purchasing in the Port Royal naval yard.

This experience in accounting and purchasing fitted him for his appointment to assistant purchasing agent for the Cincinnati companies under Mr. Schoepf's control, viz., the Cincinnati Car Company, Cincinnati Traction Company and the Ohio Traction Company. In 1910 he was made treasurer of these three companies, a few years later their auditor, and from 1921 until the reorganization of the Cincinnati traction companies in November, 1925, he served as vice-president in charge of all accounting and financing. When Mr. Schoepf relinquished his connection with the railways in Cincinnati Mr. Sanders was made vice-president of the Cincinnati Car Company and served with it in that capacity up to the time of his election as president.

Ability to pick the most capable men and to hold their confidence and respect has been one of the factors in his success. When a problem presented itself he was never satisfied with anything but an expert's solution. In his own work he has always been very accurate and thorough. He gained his complete knowledge of the industry through his ever-present desire to get to the bottom of things.

A. L. Kasemeier, re-elected vice-president in charge of sales, also has a fine record in the Schoepf companies. His official positions were auditor, treasurer and later assistant general manager of the Cincinnati Car Company. In 1924 he was elected vice-president in charge of sales, in which position he will continue to serve this company.

J. Howard Elliott, elected vice-president in charge of production and purchases, had served the car company as general manager in charge of production for the past few years. Mr. Elliott joined the Cincinnati Traction Company in 1907 as an engineer and draftsman, after completing his education at the University of Cincinnati. He was transferred to the car company in 1917 as assistant superintendent of the shops. His father, Thomas Elliott, was formerly vice-president and general manager of the car company, but is now president of the Continental Cotton Gin Company, Birmingham, Ala. Thomas Elliott, however, continues to serve the company in a consulting capacity on problems of engineering and design.

E. C. Bernhold

A. L. Kasemeier

J. H. Elliott

In oval—H. L. Sanders

The office of treasurer was assigned to E. C. Bernhold, who was formerly secretary. He will continue his duties as secretary, combining that office with treasurer. Mr. Bernhold's record with the company is an enviable one. His work came to the attention of Mr. Sanders shortly after he started with the Cincinnati Traction Company in the accounting department. The only interruption in Mr. Bernhold's connection with the car company since 1906 was during the World War, when he joined the Machine Gun Battalion as a private and later served as second lieutenant in action in France. In 1925 he was elected secretary of the car company.

Among the other officials whom Mr. Sanders has retained in his employ are Charles J. Ellis, who will be chief engineer and assistant to the vice-president in charge of production, and Dave M. Ritchie, who will be sales engineer and assistant to the vice-president in charge of sales. Mr. Ellis has been with the company since 1912 and Mr. Ritchie since 1918. S. E. Reith will continue as assistant secretary and assistant treasurer.

On this solid foundation of competent assistants Mr. Sanders will continue to build his organization and to keep it in the front ranks of car builders. In an interview, he was loath to make any prophecies, but he did say:

> We plan to continue operation with the same personnel and with the same program of building cars that are safe and that meet the public's demand for comfort. We will continue to take into our organization men of the caliber of those now serving us. We believe in the co-operative plan of education which is followed by the University of Cincinnati in its College of Commerce and Engineering. Many of these co-operative students are in our employ and we are getting only the most gratifying results.

G. B. Cortelyou Chairman Joint Utility Committee

George B. Cortelyou, president of the Consolidated Gas Company, New York, has been elected chairman of the joint committee of National Utility Associations, representing the gas, electric and street railway industries of the United States. Philip H. Gadsden, vice-president of the United Gas Improvement Company, Philadelphia, has been elected vice-chairman of the committee proper and chairman of the executive committee. Stephen Davis, formerly judge of the Supreme Court of New Mexico and solicitor of the Department of Commerce, has been appointed counsel of the committee. The Joint Committee of National Utility Associations was organized soon after the war ended. It succeeded the National Committee on Public Utility Conditions, which was organized during the war to meet the new and complex problems thrust upon the utility industry by the war. That committee, composed of P. H. Gadsden as chairman; E. K. Hall and H. H. Crowell, not only rendered very effective service to the public, but enabled the industry to co-operate with the government in all matters looking to the prosecution of the war.

It was in recognition of the great value of co-ordinated effort in all matters affecting the industry as a whole that the joint committee was formed on the discharge of the national committee at the close of the war. The joint committee is representative of the American Gas Association, the National Electric Light Association and the American Electric Railway Association.

Harry Reid's Accomplishments Reviewed at Dinner

Harry Reid, president of the National Electric Power Company, was the guest of honor at a dinner given at the Engineers Club in New York on June 2, as a token of recognition and esteem by his friends in the utility industry. The occasion was to welcome him to the fast-growing ranks of utility executives who have been brought to the country's financial center through their accomplishments in the far-flung field of the industry. Many out-of-town friends came to join in the testimonial of good will. J. N. Shannahan, past-president of the American Electric Railway Association, presided. Speakers included B. C. Cobb, Thomas J. Walsh, James H. McGraw, Frank W. Smith, L. S. Storrs, George Chappell and Mr. Reid.

The guest of the evening was characterized as a progressive. His record of accomplishments as president of the Interstate Public Service Company and the Kentucky Utilities Company was reviewed to illustrate the reasons for his promotion to a position of broadened responsibilities. This recognition of demonstrated ability was considered one of the foundation stones that has made for stability in the utility industry.

Harry Reid

Harry Reid came to New York City early in the current year, when he succeeded Albert Emanuel as president of the National Electric Power Company. At that time other changes were made in the personnel of the officers and directors of the company. These changes were, of course, the forerunner of the removal of Mr. Reid to New York, where he now makes his headquarters.

Mr. Reid has long been in the limelight in electric railway affairs. Three years ago he was made president of the Central Electric Railway Association. At that time he was president of the Interstate Public Service Company, operating between Indianapolis and Louisville, and also president of the Kentucky Utilities Company.

Mr. Reid entered the utility field at the age of 21 as cashier with the Fulton County Gas & Electric Company. In the course of the years he became identified with utility operation in Versailles and Lexington, Ky. It was through his efforts that the Insull interests turned their attention to that state and some time later the Kentucky Utilities Company became a part of the Insull holdings. At that time Mr. Reid was made president. Later the properties, comprised in the Interstate Public Service Company, were purchased and Mr. Reid became president of that company in 1917.

Mr. Reid's career was reviewed in detail in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 2, 1924, page 198.

Managing Director Storrs Honored

Lucius S. Storrs, managing director of the American Electric Railway Association, received the honorary degree of doctor of engineering at the University of Nebraska, Lincoln, Neb., on May 28. Chancellor Avery conferred the degree upon the occasion of the commencement exercises of the university and the dedication of the new museum to be known as Morrill Hall. Mr. Storrs was graduated with the degree of A.B. from the University of Nebraska in 1890, taking the scientific course. Later the degree of A.M. was given to him by his alma mater.

Three New Vice-Presidents for General Electric

The election of three new vice-presidents and the retirement of two executives of the General Electric Company were announced by Gerard Swope, president, following a meeting of the directors on May 25. C. C. Chesney, manager of the Pittsfield works; W. R. Burrows, associate manager of the incandescent lamp department, and C. E. Eveleth, manager of the Schenectady works, were elected vice-presidents of the company, taking on responsibilities in the manufacturing department. F. C. Pratt, vice-president in charge of manufacturing, and H. F. T. Erben, assistant vice-president of the manufacturing department, have retired. The other officers of the company were re-elected at the meeting.

A. T. Bagley Heads Adjustment Department in Kansas City

Arthur T. Bagley, former superintendent of employment and records of the Kansas City Railways, Kansas City, Mo., is now active head of the new adjustment department of the Kansas City Public Service Company, which replaced the claim department on April 6. Mr. Bagley's new title is manager of the adjustment department, and he reports directly to C. L. Carr, general solicitor.

Mr. Bagley joined the organization on Jan. 1, 1921, as superintendent of personnel, and shortly thereafter was placed in charge of the employment and records department. For 13 years prior to that date he was with the Department of Justice as a special agent and later as agent in charge of the department's Kansas City office. Prior to this connection with the Department of Justice, Mr. Bagley was with the War Department on harbor improvement work and the U. S. Geological Survey.

A. J. Lundberg Also Vice-President at Oakland

Alfred J. Lundberg, whose succession to the Key System Transit Company, Oakland, Cal., was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 28, 1927, has also been elected vice-president of the company.

His first business connection was with the Bank of San Francisco, which later was absorbed by the Bank of Italy. He entered the employ of the bank in 1909 and in 1910 became an employee of the state banking department under Alden Anderson, superintendent of banks. A year later he became secretary of Herbert Fleischhacker of the Anglo and London Paris National Bank in San Francisco, remaining in that capacity until 1912.

In the latter year he accepted a clerkship in the brokerage firm of J. Barth & Company in San Francisco, becoming a partner in that concern in 1926. Associated with Mr. Lundberg in the partnership of J. Barth & Company are Gustav Epstein, Harry C. Clayburgh, Richard O. Simon and James D. McDonald. Barth & Company now represent the majority of stock in the Key System and Messrs. Epstein and Clayburgh are associated with Mr. Lundberg in the directorate of the railway.

A. J. Lundberg

Alfred J. Lundberg was born in San Francisco. He received his education in the public schools of his native city. He was the first president of the San Francisco Stock and Bond Exchange Institute and is a member of the San Francisco Commercial Club and other well-known organizations.

R. W. Garvin Directs Monongahela West Penn Publicity

Ray W. Garvin, Clarksburg, has been appointed manager of the public relations department of the Monongahela West Penn Public Service Company, Fairmont, W. Va., to succeed Major Earl H. Smith, whose resignation became effective April 1 last. In his capacity as manager of the public relations Department Mr. Garvin will have charge of all the public relations work and activities of the company of every nature and description, with general supervision of advertising and advertising expenditures.

Mr. Garvin was appointed to the Monongahela West Penn family from the editorial staff of the Clarksburg *Exponent*, with which newspaper he has been associated in several capacities over a period of years. He also has been connected with the *Telegram* in Clarksburg and the *Times* in Fairmont.

In addition to his newspaper work he has engaged in general publicity work and has also devoted some time to politics. At present he is the only Democratic member of the West Virginia House of Delegates from Harrison County, and in 1923 he was also a member of the House of Delegates, being at that time the youngest member of the Legislature.

Mr. Garvin served his apprenticeship as a printer, and is still a member of the International Typographical Union, although it is more than ten years since he worked at the trade.

Judge Joseph Coult, who has been claims attorney for the Public Service companies of New Jersey since 1922 and associated with the organization since 1913, has resigned to take up the practice of law with David Satz under the firm name of Coult & Satz. Judge Coult was admitted to the bar in 1901 and served as judge of the Court of Common Pleas of Sussex County before forming a partnership with Thomas Woodruff in Newark for public practice. He went to the Public Service Dec. 1, 1913, as trial attorney. He became claims attorney June 15, 1922.

In Memoriam

AS A result of an error the name of John J. Stanley, president of the Cleveland Railway, was omitted from the list of those who answered the call of their maker in the year just closed as published in the ELECTRIC RAILWAY JOURNAL for May 28, page 980. Mr. Stanley, who died during the convention of the American Electric Railway Association in Cleveland last October, was a former president of the association. There is no need to expatiate again on the man as a character, on his ability or on the results he achieved, but the editors do desire to express to his friends and associates the deep regret they feel at the inadvertent omission of his name from the list as originally published.

Ernest Stenger Dead

Head of Denver Tramway and Former Receiver of That Property Succumbs to Pneumonia After Illness of Only Two Days

ERNEST STENGER, president of the Denver Tramway, Denver, Col., died in that city on May 28, of pneumonia. Forty-eight hours previously he was seated in his office discussing business with Vice-President Robertson.

Mr. Stenger went to the Denver Tramway as president on Sept. 29, 1920, from the Union Pacific Railroad, for which he had been superintendent of the Southern division. Subsequently he served as receiver at Denver and then as president of the successor company following the reorganization of the property.

He was a newcomer in the electric railway field when he took the post at Denver with the tramway, his previous experience having been entirely in steam railroading. Shortly after his arrival he stated that he had come to Denver to operate the tramway in such a way as best to serve the public. And that is just what he did. There were many trying experiences in connection with the conduct of the road, particularly the controversy with the city over franchise rights, but Mr. Stenger never lost sight of his announced objective. Any attempt to appraise the work of the man must take fully into account the adverse conditions under which he labored. His incumbency of the office was preceded by the period of very great increase in labor and material costs, culminating in a strike which had used up all the company's available funds. This was the heritage to which he succeeded. The prospects certainly were not rosy. Few other men would not have quailed before them, but Mr. Stenger carried through his program successfully, although his accomplishments never did approximate his dreams of what he desired the tramway to be.

When Mr. Stenger went to the tramway he had already achieved a reputation for "getting things done" as superintendent of the Southern division of the Union Pacific Railroad. At that time the office of president had been vacant since 1913, the direction of the affairs of the Denver company having been largely in the hands of Charles Boettcher, chairman of the board of directors. In addition to serving as president, Mr. Stenger performed the functions of general manager.

Like many steam railroad executives, Mr. Stenger gained much of his experience in the school of hard knocks. A civil engineer by training, he had a broad understanding of the fundamentals of the transportation industry, which not only made possible the rise to a position of responsibility with the Union Pacific, but enabled him to visualize the problems of the Denver system. He was well acquainted with the West, his entire railroad career having been passed west of the Mississippi River.

Ernest Stenger

Mr. Stenger was born in 1865 at Colmar, Alsace. Coming at an early age to the United States, he was graduated from the University of Michigan in 1886. In the same year he entered the railway service as a rodman with the Burlington & Missouri River Railroad in Nebraska. After two years of this work he was appointed a draftsman with the Atchison, Topeka & Santa Fe Railway, resigning in 1890 to become assistant engineer with the Missouri Pacific Railway.

After serving with the Missouri Pacific for ten years, Mr. Stenger resigned to join the Union Pacific System. His first position with that road was that of division engineer. He later served as assistant superintendent and as division superintendent. In 1907 he was made general superintendent of the Rio Grande Western Railway, continuing in that capacity until March, 1911. He then became general manager of the St. Joseph & Grand Island Railway, with headquarters at St. Joseph, Mo. He subsequently returned to the Union Pacific as superintendent of the Southern Division, making his headquarters at Kansas City.

During the World War he served with the American Expeditionary Forces in France as a lieutenant-colonel of the 31st Engineers. He was cited by General Pershing for efficient and capable service, and the French government conferred the Legion of Honor ribbon upon him.

Francis J. Clamer, founder of the Ajax Metal Company, Philadelphia, Pa., died recently in Collegeville. In 1868 he obtained the first practical results of anti-friction metals and raised money to start manufacturing on a large scale. Mr. Clamer was 87 years old. He was born in Hamburg, Germany, and went to Philadelphia when he was eleven years old.

Le Roy Clark, president and director of the Safety Cable Company, died on April 18 at Falmouth, Mass. He had been a prominent figure in the wire and cable industry for many years. As an electrician a year prior to his graduation from college he became connected with the predecessor of the Safety Cable Company, the Insulated Wire & Cable Company, with which he was associated during his entire business career. Later he became electrical engineer for the company and upon its reorganization in 1902 he was made vice-president. Four years later he was promoted to the presidency. Mr. Clark was a member of the American Institute of Electrical Engineers.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

General Electric Creates Engineering Council

In conformity with the action of the board of directors of the General Electric Company, an engineering council has been appointed. The council includes E. W. Rice, Jr., honorary chairman (ex officio); E. W. Allen, chairman; Elihu Thomson, A. C. Davis, W. R. Whitney, W. L. R. Emmet, C. C. Chesney and C. E. Eveleth.

The purpose of the engineering council is to advise with the vice-president in charge of engineering on the various problems that arise from time to time and as to the direction and scope of the engineering and scientific work. The council may invite other engineers to meet with it and at such times may give them the status of regular members.

Expansion by Globe Ticket Company

The Globe Ticket Company, Philadelphia, has purchased the plant and business of the Trimount Press, Inc., Boston. The plant will be enlarged and improved to manufacture, for the New England territory, all classes of tickets and checks heretofore supplied from the main factory in Philadelphia.

The Trimount Press, Inc., has been under the management of John M. Cummings for more than twenty years. Mr. Cummings becomes a director and second vice-president of the Globe Ticket Company, in charge of the new factory and office in Boston.

Recently the Globe Ticket Company established new branch offices in Cleveland and Baltimore. It has a factory and sales office in New York and a plant at Los Angeles, which is a replica of the Philadelphia factory. The Globe company is one of the oldest of its kind in this country.

Revive Plans for Mexican Interurban Lines

Plans of the Mexican Tramways for the construction of two interurban electric railways, one to run from Mexico City to Puebla, 130 miles, and the other from the capital to Pachuca, 60 miles, have been revived. It is stated that financial provision has been made for constructing the two lines and that the work will be started as soon as the surveys are finished and given formal approval by the government authorities. The route of the interurban line that is to run to Puebla will be of unusual scenic beauty as it traverses a picturesque region situated between the volcanoes of Popocatepetl and Ixtaccihuatl.

The project of constructing this road was well advanced years ago when a long period of revolution and banditry caused it to be temporarily set aside. At that time the plans included the construction of a scenic electric and cogwheel railroad up the slopes of Popocatepetl to the summit. It was intended that this road should serve also as a transportation facility for the great sulphur deposit which the crater of the volcano contains and which has been mined on a commercial scale by primitive means from time immemorial.

The Mexican Tramways is owned by Canadian interests. It operates the system of electric railways in Mexico City and the Federal District.

Transformer Prices Reduced by General Electric

General Electric Company announces a 5 per cent reduction in prices of distribution transformers and small power transformers, effective on June 1. This reduction is the sixth since 1920. On certain types of large transformers reductions which average 5 per cent for this class of product have also been made. According to J. G. Barry, vice-president, these reductions are made possible by economies resulting from improved engineering and manufacturing methods, as well as greater quantity production.

American Ideas at Economic Conference

Germany Has Adopted Our Methods, While England, France and Italy Claim They Are Not Applicable in Europe

BY EDWARD J. MEHREN
Vice-President McGraw-Hill Publishing Company, Inc.

GENEVA, May 16.

A FEATURE of the International Economic Conference is the amount of attention the United States has received. We have not, through our delegates, invited it or forced it. Europe has taken the initiative. She is keenly aware of what we have accomplished industrially and to some extent she understands our mechanism. But the English, the French, the Italians and others say that our methods are not applicable in Europe; the Germans do not say so; they are applying them.

To their generalizations, the head of the American delegation, Henry M. Robinson, replied that at least European countries could adopt our waste elimination program and, abandoning their traditional industrial secrecy, freely interchange information regarding technical methods, research, trade practices, etc. He admitted that, with unemployment large, energetic substitution of machinery for hand labor might not now be possible, but he so put the point as to indicate that mechanization was fundamental to Europe's trade and industrial recovery.

Commenting on our much-discussed industrial efficiency, several delegates denied us perfection by pointing out—and justly, too—our prodigal waste in raw materials (now happily disappearing).

Also, the Europeans believe that in America our tastes are standardized. They contend that mass production in Europe is not possible because the Europeans are individualists and demand articles that have individuality. All in all, despite their protests, it is my belief that all the protesting delegations will go home more determined than ever that, as rapidly as they can carry out the education of owners, managers and workers, American methods will be applied. Also, this thought should not be slurred over—that perhaps the expressed attitude toward American methods is political. For example, with the large unemployment in Great Britain, how could the British delegates go home and admit that they had urged mass production and the rapid mechanization of industry?

AMERICA'S FOREIGN TRADE

Commenting on the extent of American investments in Europe in recent years, W. T. Layton, editor of the *Economist*, London, asked the American delegation whether America would continue to lend freely but would not buy from Europe. He asked also whether a new equilibrium could be established in which America would buy the natural products of tropical countries on a scale large enough to

A.E.R.A.

Wise Investors Want Preferred Stock

Exhibit Space at Cleveland
Signed for Before
June 15
is a Preferred Investment.
That's Why
After Sixteen Days in the Mail
Blanks Have Been
Sent in by
151 Applicants for
69,249 Sq.Ft.
as Compared with 105 Applicants in 1926 for 50,797 Sq.Ft.
These Investors
Prefer Preferred Space
They Rather Sign Than
Be Sorry

enable her creditor position to be liquidated by a system of triangular trade.

Replying to Mr. Layton, Mr. Robinson pointed out that our imports of manufactured goods, which come mostly from Europe, have doubled from 1913 to 1926. Europe's own figures of her exports to the United States in 1925 from the five principal countries, Great Britain, Germany, France, Italy and Belgium, show an increase of 76 per cent, while her exports to the rest of the world had increased 24 per cent. In addition American tourists had spent $650,000,000 in Europe last year.

AMERICA BIGGEST BUYER

As to triangular trade, Mr. Robinson revealed that ten countries outside of Europe, where European capital is largely invested, and there is virtually no American capital, had sold to the United States in 1925 goods to the increased value of 362 per cent as against 1913, while other countries had increased their purchases by only 87 per cent. The United States buys from Brazil three times as much in value as Brazil buys from the United States, but Brazil buys three and three-quarters times as much from a "single European country" as that country buys from Brazil.

Another point that interests Americans—and surprises them—is the apparent deprecation by Europeans of the possibilities of the home market. Constantly, they harp on America's huge "homogeneous" home market. True, we have a population of 120,000,000, but not so highly homogeneous as the Europeans imagine. But Great Britain has about 43,000,000, France, 40,000,000 and Germany 60,000,000, surely markets not to be sneezed at. Moreover, one needs to remember that the American market is pretty well supplied; our standards of living are very high compared with those of Europe. Think, then, of the market afforded by the opportunity to raise European standards to a point somewhat nearer the American.

Also outstanding is a matter of omission rather than of commission—namely, the relative neglect of the need for securing economy in distribution. True, several speakers made passing reference to it, but the only vigorous declaration came from Frau Emmi Freundlich of the Austrian delegation. Of course, the conference's committee on agriculture appreciates the economics of distribution and is giving it a lot of attention.

North Shore Orders Two Trolley Storage-Battery Engines

Orders for two electric trolley storage-battery locomotives have been placed by the Chicago, North Shore & Milwaukee Railroad—the North Shore Line. They are to be used in supplying freight service to the various industrial plants along the road.

The locomotives, each weighing 65 tons, will operate either from an overhead trolley or from the storage batteries, which can be charged from the trolley while the locomotives are operating. This flexibility of operation will enable the railroad to switch cars into industrial plants equipped with tracks but without trolley connections. The complete absence of smoke, noise or noxious gases of any kind will permit the locomotives to run into buildings where a steam locomotive would be very objectionable. Each unit is equipped with four motors of 205 hp. and a battery of 192 cells, rated 600 amp.-hr., capable of delivering 260 kw.-hr. on one charge.

Operating on the battery alone one locomotive will be capable of hauling 33 loaded freight cars a distance of 5¼ miles at a speed of 12 m.p.h. on one charge. With a light load the locomotive will run on the battery at a speed of 20 m.p.h.

The locomotives are being built by the General Electric Company to order from specifications drawn up by engineers of the North Shore Line, and the General Electric Company has promised delivery in about three months. They will be used largely on the new Skokie Valley route of the North Shore Line, where many industrial plants are being located.

Details of Baltimore Car Equipment Orders

The United Railways & Electric Company, Baltimore, purchased the following new equipment for existing cars:

276 G.E. 275-F 60-hp. motors, supplied with G.E. grade M spur gearing 15:71. These motors were used in quadruple equipments for trailer pulling service, replacing older motors.

40 Westinghouse 306-CV-4 65-hp. motors, supplied with Nuttall grade BP spur gearing 14:60. These motors were also used in quadruple equipments for pulling trailers, replacing older motors.

69 car sets of G.E. auxiliary contactors, including DB 986 line breakers, No. 1518-A1 relays and LB-2 controller handles.

Ten car sets of Westinghouse 806-J-4 line breakers.

40 car sets of rheostatic electric car heating units. These units were of special design, patented by the Baltimore company and utilizing General Electric industrial heating elements.

250 car sets of G.E. three-cell aluminum lightning arresters.

At the present time the company is making plans to equip ten additional cars for train service, which will involve the purchase of twenty Tomlinson car and air couplers with five-point electrical couplers and other miscellaneous door contact and communicating signal equipment.

Electric Railroad Locomotive Shipments for April

April shipments of electric railroad locomotives from principal manufacturing plants, based on reports received by the Department of Commerce, totaled 23 locomotives, as compared with 11 in March and 28 in April, 1926. The accompanying table gives the shipments and unfilled orders of locomotives for each month since January, 1926.

RAILROAD LOCOMOTIVES

Year and Month	Shipments Domestic Electric	Shipments Foreign Electric	Shipments Total	—Unfilled Orders, End of Month— Domestic Electric	Unfilled Orders Foreign Electric	Unfilled Orders Total
1926						
January	11	2	13	53	42	95
February	22	2	24	60	40	100
March	11	1	12	50	41	91
April	12	16	28	44	29	73
Total (four months)	56	21	77	..	..	..
May	14	9	23	46	23	69
June	11	3	14	53	20	73
July	20	..	20	36	23	59
August	16	7	23	26	16	32
September	13	7	20	24	11	35
October	15	..	15	20	13	33
November	15	1	16	27	15	42
December	17	11	28	14	8	32
Total (year)	177	59	236	...	...	...
1927						
January	8	2	10	16	6	22
February	10	1	11	22	9	31
March	11	..	11	48	9	57
April	23	..	23	35	10	45
Total (four months)	52	3	55	...	...	...

A $126,662 Scrap Pile in Toronto

Scrap materials were sold by the Toronto Transportation Commission for $126,662 in 1926. Nothing which has the slightest commercial value is wasted or thrown away. For example, lead foil from electric tape and wrappings, etc., brought more than $500. All burnt-out and broken electric light bulbs are saved, and the butt, being constructed of brass, is salable. These butts last year sold for more than $40.

Babbitt metal for axle bearings, when worn down, is melted and used again. There is, however, a form of slag which lies on top and cannot be used in a good bearing. This is sold as scrap, and last year more than $480 was received from this waste metal.

Aluminum cuttings from the construction of coach bodies, stanchions of street cars, etc., brought in $141, machine cuttings from copper and brass articles manufactured in the shops sold for $1,369, scrap brass and copper parts sold for more than $11,000.

The balance and larger part of the $126,000 is made up of scrap rail, wheels, lead, etc., from dismantled batteries, malleable and cast iron, pipes, steel, rubber and old plush cushions.

All scrap metal is collected from various sections and turned into the Hillcrest stores, where it is sorted. Different kinds of metal are placed in individual bins and sold separately, as much better prices are thereby obtained.

Copper Climbs Close to 12¾ Cents

A DISTINCTLY better feeling existed in the non-ferrous metal markets June 1 than prevailed a week ago, reports *Engineering and Mining Journal.* Copper, which sagged to 12½ cents delivered in the East, has recovered sharply, and on a good volume of business approached 12¾ cents June 1, one or two sales at 12⅝ making it impossible to quote the even quarter. Zinc, likewise, has advanced from 6 cents to 6.10 cents during the week, though the market has not been active. Lead is down ten points from a week ago, but business has picked up, and the tone of the market seems good. Tin was bought in fair quantity on one or two days, and prices are somewhat firmer. Antimony, on the other hand, is easier, and the market is lethargic. Platinum continues exceptionally dull, with prices, largely nominal, somewhat lower than last week.

Only about 10,000 tons of copper changed hands at 12.50 cents on the latest movement. This includes sales at the low figure on Wednesday, Thursday, and Friday of last week. On each day there was sufficient business at 12⅝ cents in the East and 12¾ cents in the West to keep the quotation above 12½. On Friday most of the 12.50 cent metal had disappeared and 12⅝ cents represented the bulk of the sales. On Saturday and Tuesday, Monday being a holiday, business continued good at 12⅝ cents.

Last Thursday lead prices declined a further ten points, in both the New York and the St. Louis markets, following a 5s. decline in London. On that day, May 26, the American Smelting & Refining Company reduced its contract price from 6.50 to 6.40 cents, New York, and sellers in the Middle West came down from 6.15 cents, St. Louis, to 6.05 cents. Business on the whole has been somewhat better; Monday's holiday of course cut into the total, but inquiries June 1 were improved. Battery and cable makers continue to be only small factors in the market.

The tin market ruled very quiet until May 31, when there was a scramble among dealers and prices for all positions were marked up quite a bit during the day. The advance in London June 1 was much less than expected, but the New York market continued strong, and prices were again higher. Tin for delivery three months hence has averaged about 3 cents per lb. below the price of prompt Straits, early deliveries continuing exceedingly scarce. Prompt Straits in New York June 1 sold at 67½ cents, which is ¼ cent below a week ago, but ½ cent above the low during the week.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	June 1, 1927
Copper, electrolytic, cents per lb.	12.50
Copper wire, cents per lb.	15.125
Lead, cents per lb.	6.40
Zinc, cents per lb.	6.45
Tin, Straits, cents per lb.	67.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings, Kansas City, net tons	2.50
Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.70
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.62

For the time being at least the zinc market has turned upward from the 6 cent level reached May 26. Output from the Joplin mines has shown progressive decline to about 10,000 tons of zinc concentrate per week. Although only 6,000 tons was sold last week, it is believed that the reason was the disinclination of sellers to accept $38 rather than the lack of demand on the part of smelters.

Rolling Stock

New York Central Railroad, New York City, has ordered fifteen gasoline-electric motor cars for delivery within six months. Two of the cars will operate on the Fort Wayne-Jackson branch of the Lansing division. They will replace steam trains. Each unit will be 73 ft. long.

Detroit, Monroe & Toledo Short Line Railway, Detroit, Mich., is equipping its rolling stock with individual automobile seats. Cars on other long runs will be similarly equipped, it has been announced by A. L. Drum, receiver for the properties.

Trade Notes

Graham Brothers Corporation, New York City, announces the formation of a financial organization to operate in the industrial field. Offices have been opened at 1 East 44th Street, New York City.

L. H. Gilmer Company, Tacony, Philadelphia, Pa., through its board of directors, has elected Frank B. Supplee treasurer of the company. Mr. Supplee has been with the company for twelve years, working up from a minor position.

Electric Controller & Manufacturing Company, Cleveland, Ohio, announces the appointment of the firm of J. B. McCarthy & W. P. Robinson as representatives in Canada. The offices are at 307 Reford Building, Toronto, Canada, and 808 Drummond Building, Montreal, Que., Canada. The appointment of the Petroleum Electric Company, 217 East Archer Street, Tulsa, Okla., as representative in Oklahoma and the Panhandle District of Texas also is announced.

Lincoln Electric Company, Cleveland, Ohio, announces the appointment of the Wade Engineering Company, 1855 Industrial Street, Los Angeles, Cal., as distributor of Lincoln products in California. The company maintains a branch at 69 Webster Street, Oakland, Cal., both main office and branch carrying stock of Lincoln "Linc-Weld" motors and "Stable-Arc" welders, as well as service parts. The Los Angeles branch is in charge of Henry N. Wade, who is also president of the company. Mr. Wade is a graduate of Cornell University. H. T. Lintott, also an experienced electrical engineer, has charge of the Oakland branch.

Griffin Wheel Company, Chicago, Ill., has elected A. A. Hale vice-president. He is the Eastern sales manager.

ASTUTE ENERGETIC RATIONAL ADVERTISING
Have you sent in your application for exhibit space
at Cleveland, Oct. 3-7 ?

A thrifty man

A thrifty individual when replying to a good natured critic of his non-spending habit replied.

"I save money so when the day comes that I need it I shall have it. And mind you that day comes to every man."

A spirit akin to thrift brings about the specifications of PEACOCK STAFFLESS BRAKES for most of the cars being built today. They are standard equipment because of their unfailing ability to function when they are needed —"and mind you that day always comes—".

We will be glad to furnish you estimates on your requirements.

THE MODERN BRAKE—
"PEACOCK" STAFFLESS
REG. U. S. PAT. OFF.

National Brake Co., Inc.
890 Ellicott Sq., Buffalo, N. Y.
Canadian Representative:
Lyman Tube & Supply Company, Limited, Montreal, Canada

PEACOCK STAFFLESS BRAKES

On the better Motor Coaches

BROCKWAY

is Leece-Neville Equipped

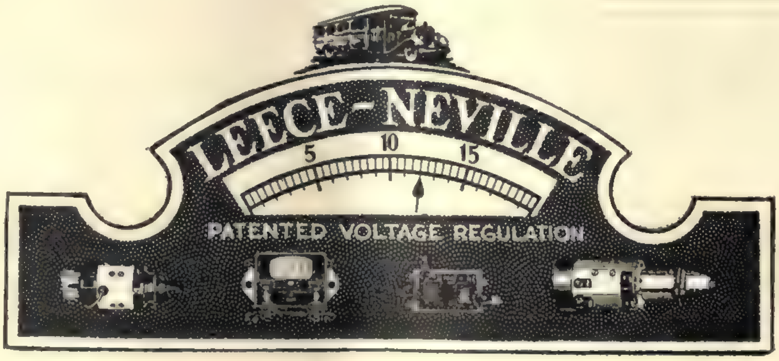
Motor Coach service is severe. The best equipment of any type is necessary to prevent "shop loafers" and to maintain schedules.

That is why Brockway specifies Leece-Neville Patented Voltage Regulators as standard equipment.

Batteries cannot be overcharged. They are charged only at the correct rate for their condition. They go longer without refilling. Naturally battery life is greatly prolonged.

Lights can be operated direct from the generator, when the engine is running, without flicker—even if battery isn't connected. It won't overheat or burn out. And—

Input being in proportion to output, Leece-Neville is the most economically operated generator system for motor coach use.



The Leece-Neville Company
5353 Hamilton Ave., Cleveland, Ohio

Bring on your mud!

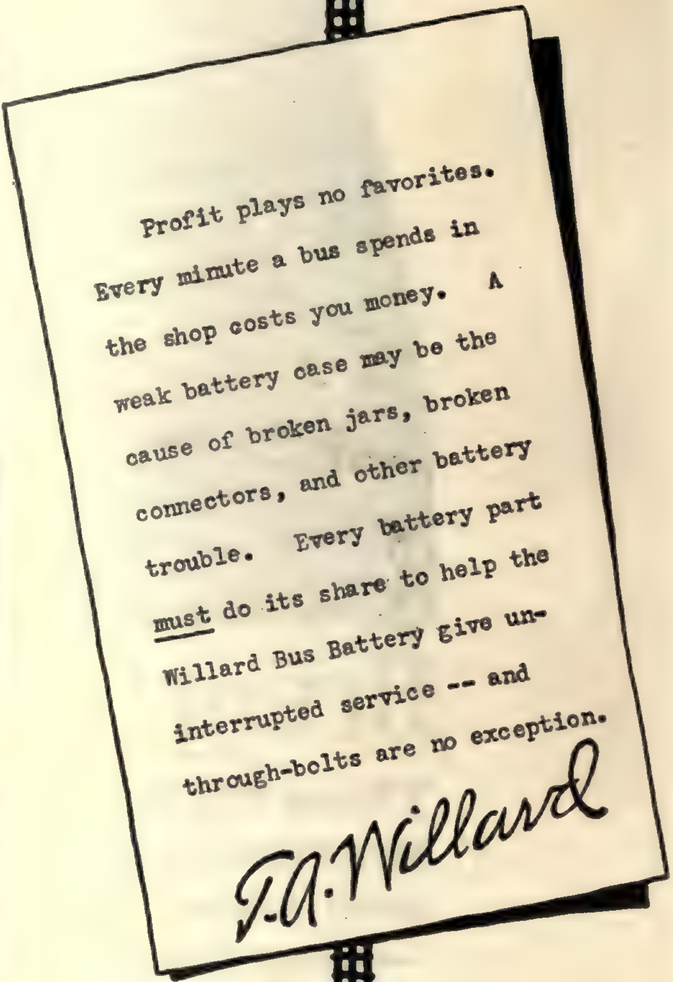
Those big traction cogs will pull the heaviest loads through mud, sand and snow. Under tons of weight —over longest mileage—through worst hauling conditions—Goodrich Truck Tires are making good, for some of the largest fleet operators on the road.

Goodrich

FOR TRUCK TIRES

THE B. F. GOODRICH RUBBER COMPANY
AKRON, OHIO —*In Canada:* CANADIAN
GOODRICH COMPANY, KITCHENER,
ONTARIO

Make Every Bus
Pay a Profit



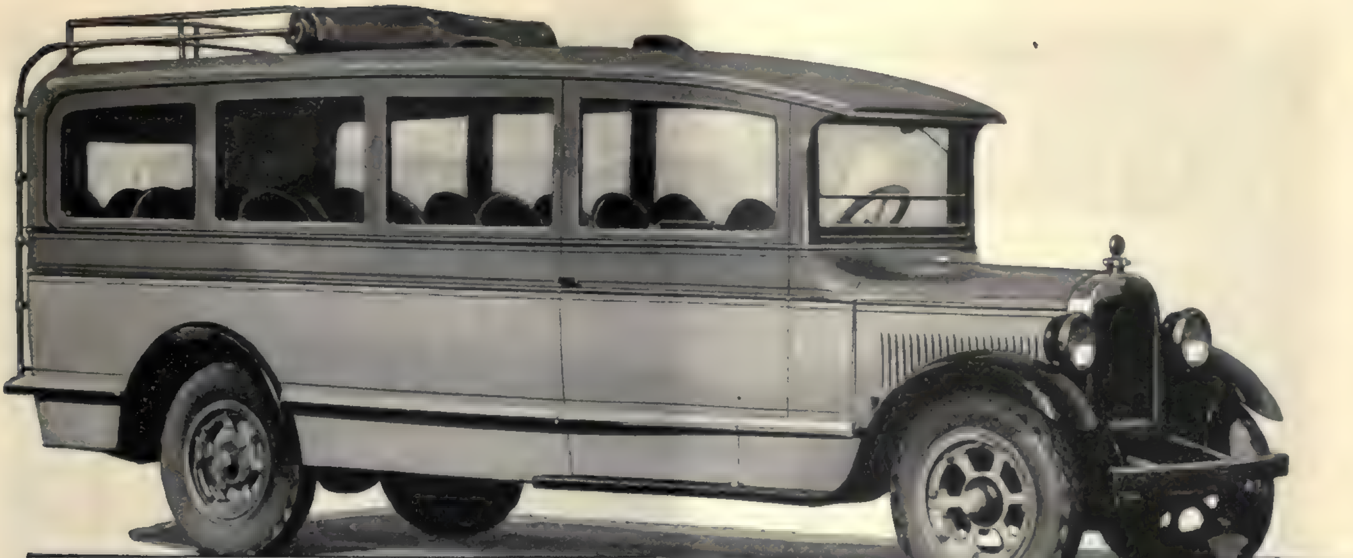
Profit plays no favorites.
Every minute a bus spends in the shop costs you money. A weak battery case may be the cause of broken jars, broken connectors, and other battery trouble. Every battery part must do its share to help the Willard Bus Battery give uninterrupted service -- and through-bolts are no exception.

T.A. Willard

Heavy through-bolts add to the strength of the case, keeping it from sagging (a precaution of especial importance in large-size batteries). These bolts, extending through the partitions, hold the jars firmly in place. Even the through-bolts make their contribution to uninterrupted battery service.

WILLARD STORAGE BATTERY COMPANY
CLEVELAND, OHIO

Willard
Batteries



Comfortable chair type seats are so arranged that the interior is roomy and beautiful. Ample aisle space. Plenty of leg room. Air filled spring seat cushions are upholstered in leather and seat backs have detachable leather covers.

16-Pass. Parlor Coach, complete - -	**$3995**
12-Pass. Parlor Coach, complete - -	**3750**
21-Pass. Street Car Type, complete -	**3815**

Prices f. o. b. Detroit

Parlor Coach

(*16 Passengers*)

For De Luxe Service

Far-seeing Electric Railway operators are offering their patrons a deluxe motor coach service—and profiting by it.

Graham Brothers Parlor Coaches are ideal units for such a service—fast, dependable, attractive, comfortable.

They can be operated with profit on special short routes or in express service on longer routes, even paralleling other transportation. Patrons are glad to pay higher fares for this special service.

GRAHAM BROTHERS
EVANSVILLE – DETROIT – STOCKTON
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONTARIO

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

Baker
Raulang
TRADE MARK REG. U.S. PAT. OFF.
BUS
BODIES

RIDING comfort, added seating capacity, long life, low upkeep cost, are a few of the many *provable* advantages of Baker-Raulang Bus Bodies—the result of 73 years of body-building experience.

A full line is offered, varying from 17 to 29-passenger capacity, designed for city, surburban and parlor car service.

Descriptive bulletins gladly sent on request.

THE BAKER-RAULANG COMPANY
Bus Body Division CLEVELAND, OHIO

International Model 15

Club Coach	15-passenger
Sedan Coach	17-passenger
Street car type	15-passenger

INTERNATIONAL HARVESTER now maintains 136 Company-owned branches in the United States for the prompt servicing of *International Harvester Automotive Equipment.* Do you know of an organization to equal it?

INTERNATIONAL HARVESTER *Six-Cylinder* COACHES

MODEL 15 International Coaches have been developed and perfected to fit the biggest popular demand in motor coach transportation. They serve perfectly the operator who wants medium capacity [15-17 passengers] and medium investment, but who also needs top quality—the top quality in engineering and assembly that means economical operation—the top quality in body and appointment that keeps and adds to patronage and so makes profit for his route.

Model 15 International Coaches are demonstrating their exceptional values on the well-beaten highways and in far corners of the country, pointing again to the automotive service for which International Harvester is noted. International Harvester will help you give your riders efficient, dependable, luxurious transportation—at the lowest cost.

At the right: Glimpses of an International Model 15 Club Coach Interior. Clear vision at every angle, perfect comfort for every rider, attractive draperies and appointments, every provision for good lighting, heating, and ventilating, and for safety.

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
(Incorporated)
606 So. Michigan Ave. Chicago, Illinois

Safeguard and Accelerate Traffic

Automatic Signals by providing proper spacing of cars or trains, reduce trip time and enable more cars to be operated with consequent safety.

Interlocking installations at terminals and at grade crossings eliminate unnecessary stops and assure route continuity by means of signal indications.

Highway crossing protective devices of the flashing light, automatic flagman, or audible type, or combination of same, are a dependable insurance which soon pays off the investment.

Power operated remotely controlled switches are being used economically to accelerate Electric Railway traffic.

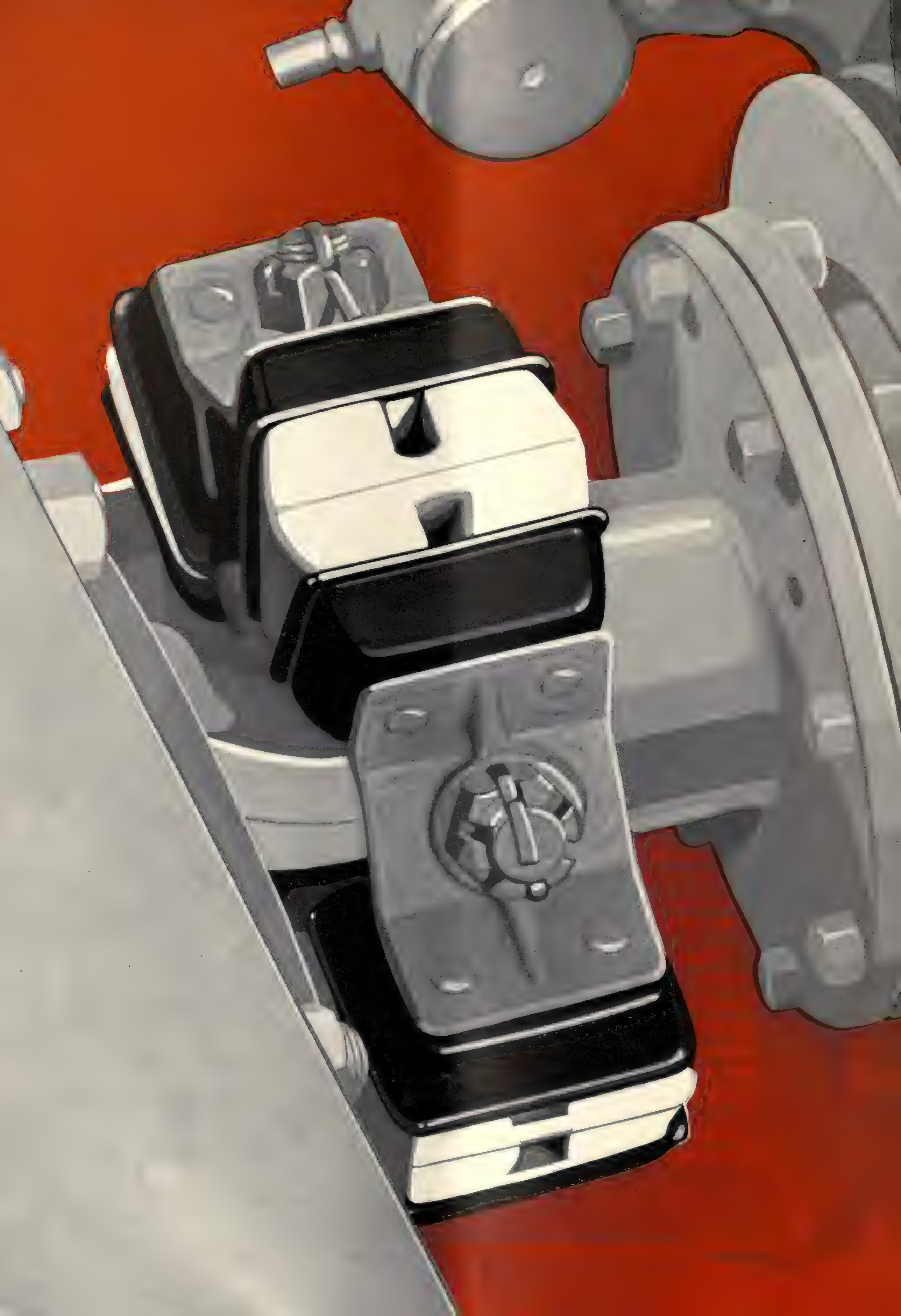
These Systems are products of the

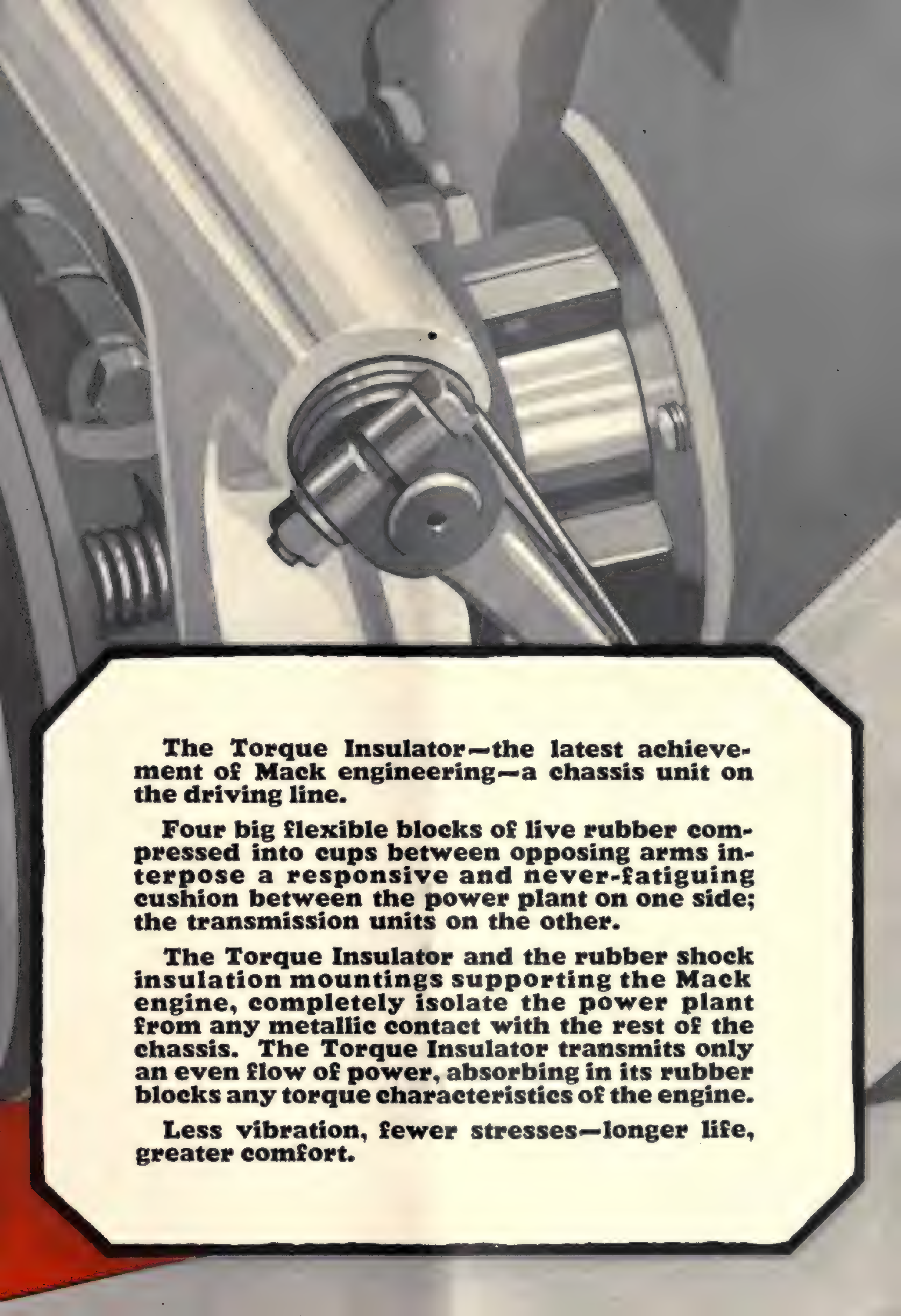
TRADE MARK **Union Switch & Signal Co.** TRADE MARK

SWISSVALE, PA.

Such even Torque!

To dampen out torque vibration.





The Torque Insulator—the latest achievement of Mack engineering—a chassis unit on the driving line.

Four big flexible blocks of live rubber compressed into cups between opposing arms interpose a responsive and never-fatiguing cushion between the power plant on one side; the transmission units on the other.

The Torque Insulator and the rubber shock insulation mountings supporting the Mack engine, completely isolate the power plant from any metallic contact with the rest of the chassis. The Torque Insulator transmits only an even flow of power, absorbing in its rubber blocks any torque characteristics of the engine.

Less vibration, fewer stresses—longer life, greater comfort.

The Houston Electric Company, a Stone & Webster operation
adds the Mack six-cylinder to its fleet

Pioneering

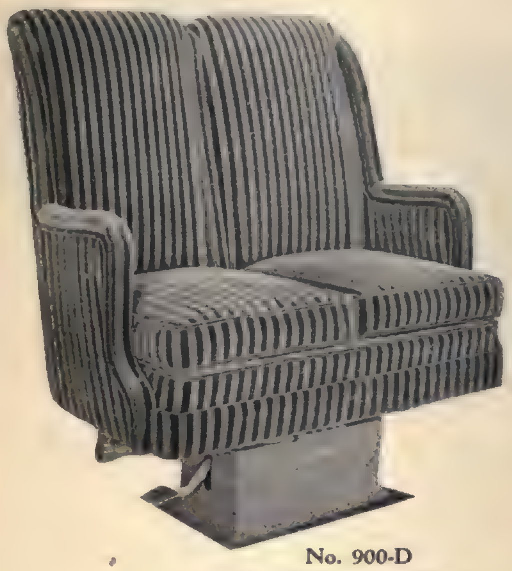
When Mack invented the Torque Insulator, history repeated itself. Mack demonstrated leadership in new development—in the exclusive use of patented features.

The Houston Electric Company knows the value of this recent Mack development—the Torque Insulator—which entirely eliminates metallic contact between the power plant and the chassis.

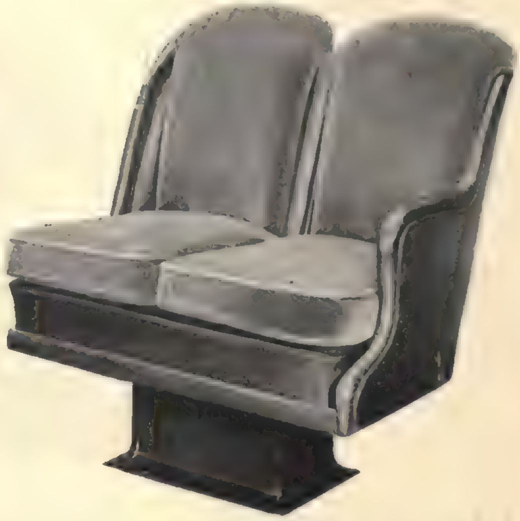
On the road, resultant freedom from vibration builds good will. On the cost sheets, dampening of torque vibration and sudden clutch strains save in maintenance.

Look to Mack for new developments—for pioneering!

Mack Trucks, Inc.
International Motor Company
25 Broadway, New York City



No. 900-D
Double Rotating Chair



No. 900-D
Double Stationary Chair

Two typical H-K installations

Two typical examples of how Hale-Kilburn Seats fit into modern electric railway programs—

The Washington, Baltimore and Annapolis Railroad's **new articulated cars** are equipped with H-K No. 900-D rotating double chairs with curved back, heavily padded, individual spring cushion seat pads, individual arm rests at each side, and pedestal device for rotating to opposite position. They are plush covered; luxurious and comfortable.

The remodeling program of the Northern Ohio Traction Co. also called for H-K Seats. These were the No. 900-D double chairs with deep individual seat cushions, divided back and permanent base for one-end cars. These comfortable practical seats are upholstered in a combination of plush and leather.

Whether yours is a new car program or a remodeling program, get full particulars of H-K Seats for every type of service.

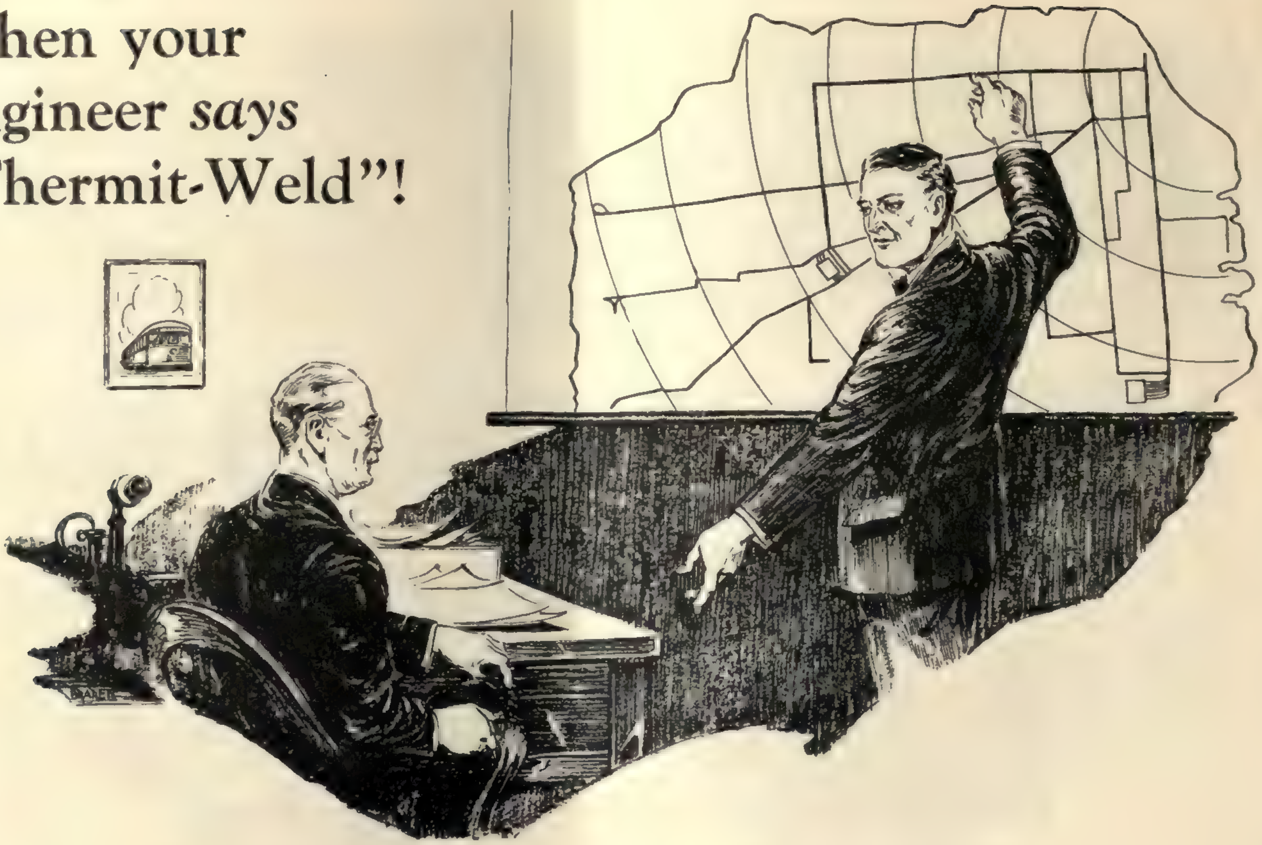
HALE-KILBURN COMPANY
General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler B'dg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco
T. C. Colman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS

When your Engineer *says* "Thermit-Weld"!



He wants to conserve your Company's revenue

Your engineer is a man accustomed to study all angles of a problem. He balances initial expense against ultimate cost. He considers the effects of track welding on other departments — rolling stock and transportation. He's trained that way! He's an engineer!

He knows it's not enough merely to repair the cupped joints on existing track. He knows that the repair jobs seldom last. He abhors temporary expedients as wasteful and costly in the long run. He knows that Thermit welding eliminates the joints, and gives the track another lease of life—as long as the rail head itself will last.

New cars improve your service and attract more revenue. Thermit-welding the track improves operating conditions for the new cars, and conserves your revenue. *Give your track engineer the modest appropriation he needs to do the job properly.*

THERMIT

METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.
PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

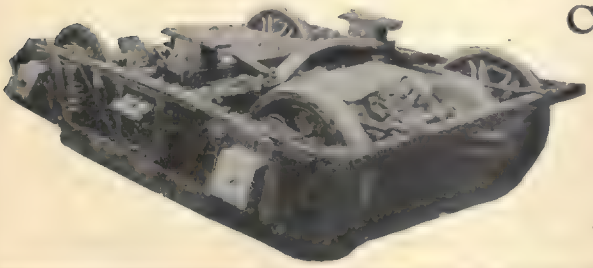
Modern Rolling Stock

Increases Earnings

ON many properties, both city and interurban lines, new cars of the modern type are attracting more patronage and operating at less expense than the older cars they replaced. New cars will do the same on your property. Let our engineers help you plan equipment to meet today's needs.

Cummings Car and Coach Company

Successors to McGuire Cummings Mfg. Co.
111 W. Monroe Street
CHICAGO



TYPE MC62 LOW CAR BODY TRUCK

LIGHT WEIGHT CITY AND INTERURBAN CARS. SINGLE AND DOUBLE TRUCKS. GAS-ELECTRIC MOTOR-COACH

If maintenance costs are a problem— here's one answer—

BOYERIZE!

There's no difficulty in figuring the economy of Boyerized brake and truck parts that outwear ordinary hardened steel three to four times, even if they should cost twice as much!

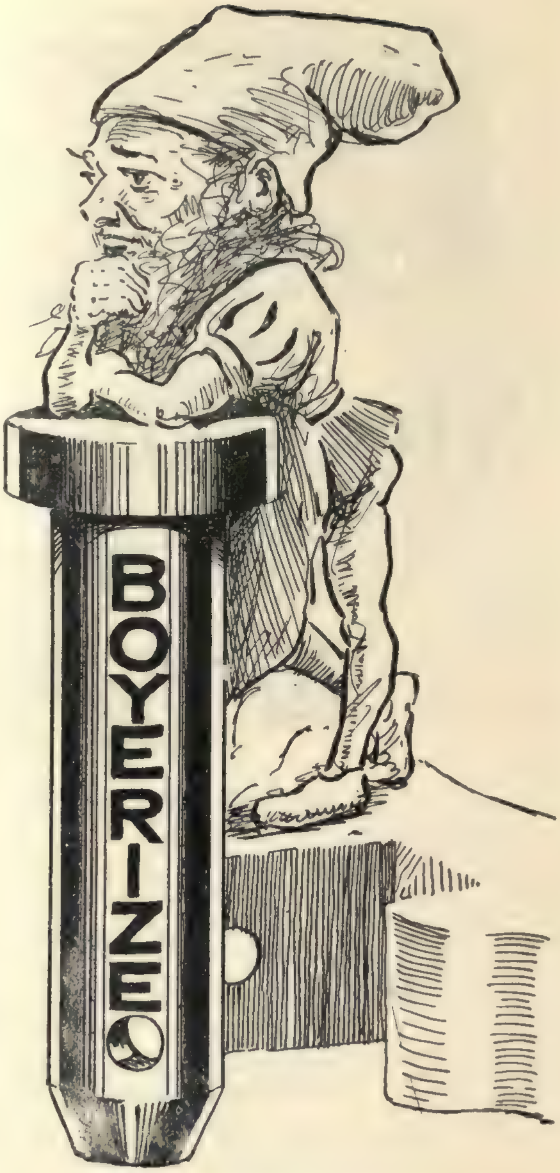
Boyerized parts *do* last from three to four times as long as ordinary steel parts. But remember that they do *not* cost twice as much.

Try Boyerized Car Parts under your own operating conditions and note their ability to stand up under the most severe service. This test will prove that to Boyerize is to economize!

Let us quote on your requirements.

Bemis Car Truck Company
Electric Railway Supplies
Springfield, Mass.

Representatives:
Economy Electric Devices Co., 72 West Van Buren Street, Chicago, Ill.
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
W. F. McKenney, 54 First Street, Portland, Ore.
J. H. Denton, 1328 Broadway, New York City, N. Y.
A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.



The BOYERIZED List

- Brake Pins
- Brake Hangers
- Brake Levers
- Pedestal Gibs
- Brake Fulcrums
- Turnbuckles
- Center Bearings
- Side Bearings
- Spring Post Bushings
- Spring Posts
- Bolster and Transom Chafing Plates

LOOK FOR THIS MARK

"STANDARD" STEEL PARTS

Steel Axles

Steel Springs

Armature Shafts

Rolled Steel Wheels

Contributing to Comfort, Too

"Standard" Steel Springs and Rolled Steel Wheels contribute to the comfort of car riders. "Standard" Steel Axles and Armature Shafts may not add *directly* to their comfort but it is comfortable to know that such dependable forgings have been used.

STANDARD STEEL WORKS COMPANY
PHILADELPHIA, PA.
BRANCH OFFICES
CHICAGO ST. LOUIS
NEW YORK HOUSTON
PORTLAND RICHMOND
SAN FRANCISCO ST. PAUL
PITTSBURGH MEXICO CITY
WORKS: BURNHAM, PA.

power interruptions by providing the strongest pole line foundation to carry transmission and service lines.

Creosoted Yellow Pine Pole are 44% stronger than the nearest other pole wood. This strength is permanent because the deep penetration of creosote oil over the whole length makes them decay-proof and insect-proof.

International Creosoted Pine Poles are quality poles—sound timber and scientific treatment under rigid control. They provide the safest and most economical pole line.

International Creosoting & Construction Co.
General Office—Galveston, Texas

International Creosoted Pine Poles near Indianapolis, Ind., in Service of Big Four Ry.

What 'Wrought Steel' means to wheel users

"Wrought," according to Webster's Dictionary, means "worked; elaborated; not rough or crude."

So we might call it "worked" Steel, because that's exactly what it is—worked; not crude. To obtain Wrought Steel, the ingot is first rolled into blooms, which are cut into discs of the desired length—one for each wheel. The disc then cools completely, after which all scale is chipped off. Then the disc is reheated, after which it is forged under 10,000-ton hydraulic presses—(twenty million pounds!) After several forgings, in which the wheel takes its final shape, it passes to the rolling mill, pictured above, where plate and rim are thoroughly rolled. After cooling, the wheels are rough bored and machined to proper contour. This process completed, there is no possibility of irregularity in the wheel structure that could cause fracture.

Carnegie Wrought Steel Wheels assure the user the longest possible life and the greatest possible safety. Their unusually long service guarantees economy.

Send for the catalogue—"Wrought Steel Wheels and Axles"

CARNEGIE STEEL COMPANY

General Offices • Carnegie Building • 434 Fifth Avenue

PITTSBURGH PENNSYLVANIA

1862

If you want more life from your trolley poles

IT is the natural desire of every good manager to use trolley poles which include those advantages that make for long life in service. Therefore, consideration should be given to the methods of manufacture, the skill of the organization, the tests given the poles at the mill and the probable cost of upkeep.

"NATIONAL-SHELBY" Seamless Steel Trolley Poles are made by the largest manufacturer of wrought tubular products in the world, by skilled workmen under expert supervision and put through severe tests which represent the hardest kind of service conditions. In addition, "NATIONAL" Trolley Poles include the desired advantages of durability—strength—low upkeep—and attractiveness—which make longer life in service.

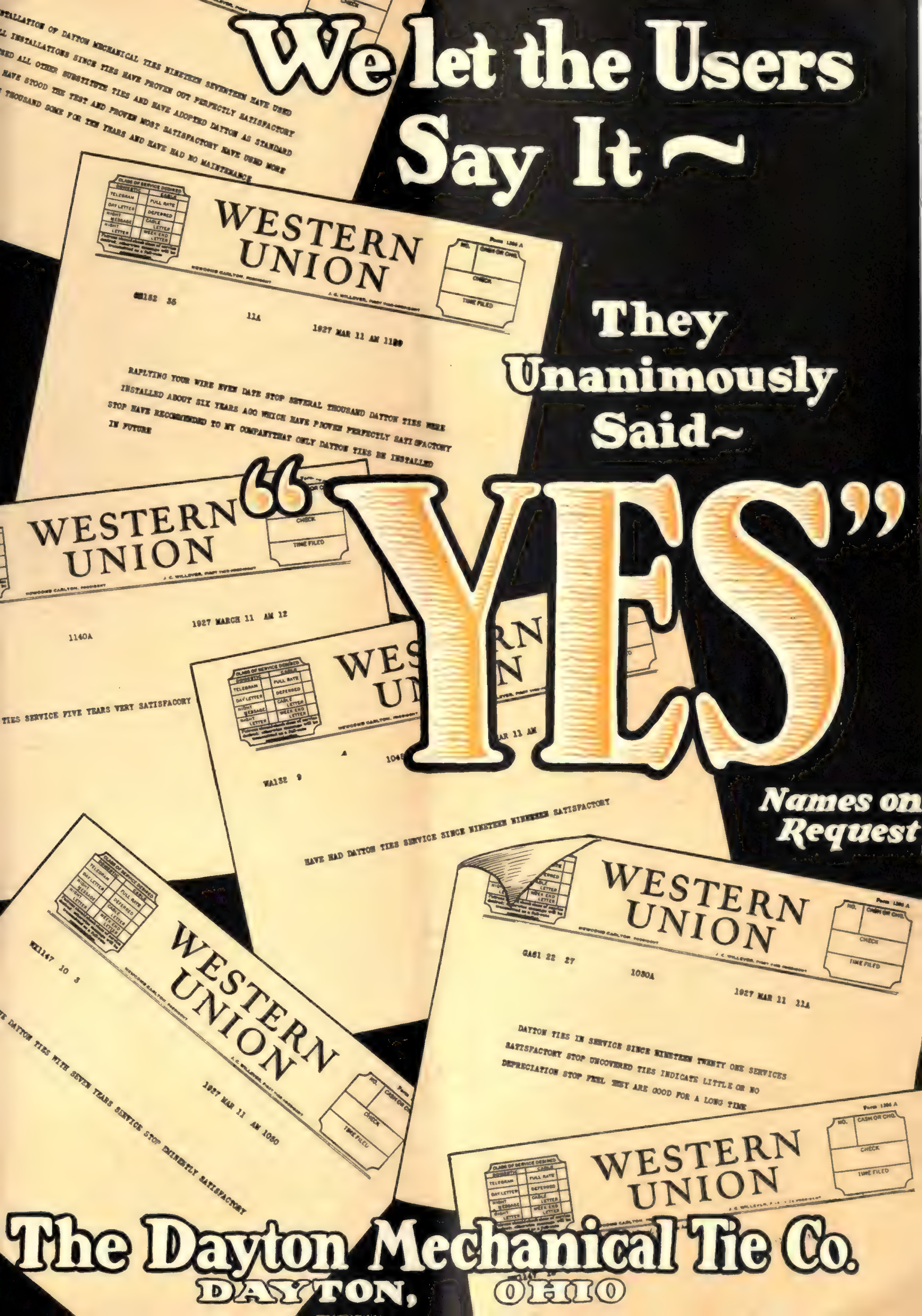
If you want more life from your trolley poles, be sure you

Use "NATIONAL" SHELBY

Seamless Steel Trolley Poles

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

District Sales Offices in The Larger Cities



STALLATION OF DAYTON MECHANICAL TIES NINETEEN SEVENTEEN HAVE USED
LL INSTALLATIONS SINCE TIES HAVE PROVEN OUT PERFECTLY SATISFACTORY
RED ALL OTHER SUBSTITUTE TIES AND HAVE ADOPTED DAYTON AS STANDARD
HAVE STOOD THE TEST AND PROVEN MOST SATISFACTORY HAVE USED MORE
THOUSAND SOME FOR TEN YEARS AND HAVE HAD NO MAINTENANCE

GE152 35

11A

1927 MAR 11 AM 1100

RAPLYING YOUR WIRE EVEN DATE STOP SEVERAL THOUSAND DAYTON TIES WERE
INSTALLED ABOUT SIX YEARS AGO WHICH HAVE PROVEN PERFECTLY SATISFACTORY
STOP HAVE RECOMMENDED TO MY COMPANYTHAT ONLY DAYTON TIES BE INSTALLED
IN FUTURE

1927 MARCH 11 AM 12

1140A

TIES SERVICE FIVE YEARS VERY SATISFACORY

AR 11 AM

A

104

WA132 9

HAVE HAD DAYTON TIES SERVICE SINCE NINETEEN NINETEEN SATISFACTORY

WX1147 10 3

1927 MAR 11 AM 1050

E DAYTON TIES WITH SEVEN YEARS SERVICE STOP EMINENTLY SATISFACTORY

GA61 22 27

1030A

1927 MAR 11 11A

DAYTON TIES IN SERVICE SINCE NINETEEN TWENTY ONE SERVICES
SATISFACTORY STOP UNCOVERED TIES INDICATE LITTLE OR NO
DEPRECIATION STOP FEEL THEY ARE GOOD FOR A LONG TIME

11 Telegrams of Inquiry Brought 11 Favorable Replies in 5 Hours

A short time ago, a prospect was in doubt as to whether or not he should buy Dayton Mechanical Ties.

To drive home to him what Dayton Ties really mean to the Electric Railway Industry, we turned over to him our list of users, and told him to write or wire any or all of them.

He selected eleven at random, and wired them. In five hours eleven favorable replies came in, several of which are reproduced on the preceding page of this insert.

There wasn't a knock in the whole bunch, a fact that was no surprise to us.

We don't need to tell you much more, except to say again that in the 15 years since the inception of Dayton Ties, no track laid on them has ever worn out, or cost a penny of maintenance—Dayton Ties give you permanently smooth track, through indefinite preservation of the concrete ballast.

One hundred and twenty-five cities throughout the United States, each have one or more Dayton Tie Installations. There is at least one near you—we'll tell you where it is—see it. Or—we'll send you the whole list if you want it.

**The Dayton
Mechanical Tie Co.
DAYTON, OHIO**

If the Steam Turbine could be Operated on "any kind of oil"—

the lubricating engineer would have little to worry about.

But the modern turbine being what it is—a machine operating under conditions quite different from other types of power units—calls for oils which are especially adapted to its lubricating requirements.

To withstand the high bearing pressures and temperatures, the oils must be of the correct viscosity.

Again, they must be of proper viscosity to be certain to function at the varying degrees of clearance.

And, in order to be sure that the prevailing high speeds will not break up the oil film, the oil must be one that will not emulsify.

The Texas Company, with its years of research and perfection of refining methods has produced a type of steam turbine lubricants which have met with remarkable success under the most unusual conditions.

So that today, to hundreds of steam turbine operators in this country and throughout the world, the selection of the adequate lubricant is no longer a problem. They have found that

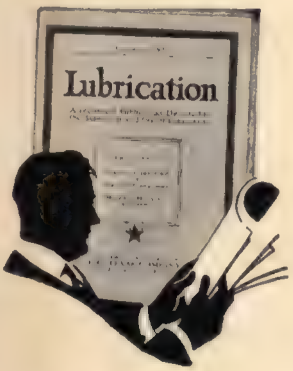
TEXACO REGAL OILS
for STEAM TURBINES

are uniformly dependable in meeting their most exacting requirements and this is why:

1. TEXACO REGAL OILS conform to the requirements of the U. S. Navy emulsion test.
2. They are refined to the specifications of the National Electric Light Association.
3. They are obtainable in four distinct ranges of Saybolt viscosity at 100° Fahr., as follows:

TEXACO REGAL OIL "A"......	145 Seconds
TEXACO REGAL OIL "B"......	180 Seconds
TEXACO REGAL OIL "C"......	300 Seconds
TEXACO REGAL OIL "E"......	500 Seconds

We shall be glad, at all times, to co-operate with you in the matter of Steam Turbine lubrication, and we would thank you to address your inquiries to our nearest District Office.



Every month our magazine "Lubrication" publishes articles of interest to Engineers, Power Plant Executives and all others whose professional activities require an understanding of the economical selection and use of lubricants.

This magaine will be sent to you each month free, if you will just write to the address below.

THE TEXAS COMPANY
Texaco Petroleum Products
Dept. E61, 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

TAYLOR TRUCKS
for
PORTO RICO

Porto Rico
Ry. Lt. & Pr. Co.
San Juan

TAYLOR ELECTRIC TRUCK CO.
***Manufacturers* Railway Car Trucks—Truck and Bus Springs**
TROY, N. Y., U. S. A.

What we do with returned questionnaires

1. The information is tabulated and grouped in accordance with the basic problems of production and selling.
2. A careful study of the results is made and interpreted to specific industries and markets that can benefit by the information.
3. Distributed through the editorial pages of McGraw-Hill Publications to all ramifications of industry; to various government and statistical bureaus and to important newspapers published in leading industrial centers.

Every McGraw-Hill questionnaire that you fill in contributes just so much to the accuracy of McGraw-Hill data on industry and trade.

THE PUBLISHERS

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

Barron G. Collier
INCORPORATED
CANDLER BLDG. NEW YORK

Many uses for Time Switches

Use these Automatic Switches for Series Street Lighting Circuits, Automatic Substation control, Electric Signs, Illuminated Billboards, control of Display Window Lighting, Two Meter Service, Apartment House Lighting and for other purposes.

Send for the forty-eight page illustrated bulletin No. 37 showing the various types of Time Switches and also the attachments which increase their usefulness.

A. & J. M. Anderson Mfg. Co.
289-305 A St.
Boston, Mass.
New York Chicago
Philadelphia London

Whatever your requirements
specify
Le Carbone Carbon Brushes

They talk for themselves

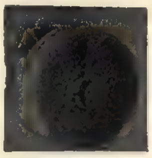
W. J. Jeandron
Factory Terminal Bldg.,
Fifteenth Street, Hoboken, N. J.
Pittsburgh Office: 634 Wabash Bldg.
Chicago Office: 1657 Monadnock Block
San Francisco Office: 525 Market Street
Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

Griffin Wheels
with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban Railways

FOUNDRIES:

Chicago
Detroit
Denver
Cleveland
Boston
Kansas City
Council Bluffs
Salt Lake City
St. Paul
Los Angeles
Tacoma
Cincinnati



Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

Earll Catchers and Retrievers
C. I. EARLL, York, Pa.

Canadian Agents:
Railway & Power Engineering Corp., Ltd., Toronto, Ont.
In All Other Foreign Countries:
International General Electric Co., Schenectady, N. Y.

Insures Collection of Correct Fares and Records all Details

No mistake can be concealed when tickets are printed and fares are recorded by the Ohmer No. 79 Ticket-Printing Register, because the passenger's ticket shows just what the ticket seller collects. Knowing what has been paid, the passenger will protest if the ticket shows a different amount.

Besides the amount paid, the ticket shows the date, point of departure, destination, class of fare, consecutive number, and number of register. And all this information, with the ticket seller's number also, is printed in duplicate—*from the same type*—on a record locked in the register. There can't be a discrepancy.

Protects all Parties

The passenger receives and holds the ticket. It protects the passenger from double collection. And it eliminates overriding.

When the cash is turned in, it must tally with the record in the register. There's no occasion for disputes. The company is protected, and the ticket seller also is protected from temptation.

By doing away with preprinted tickets, the Ohmer saves the expense of printing and much of the expensive detail usually necessary in ticket accounting. The Ohmer prints tickets only as needed and keeps a complete account of every transaction. And the record can't possibly be altered.

Learn all the Facts

Ask us for detailed information. Let us send you a full description of Type 79 Ohmer with samples of tickets and records. Better still, ask for a demonstration. That places you under no obligation. But you'll find the Ohmer so indispensible that you can't afford to get along without it.

OHMER FARE REGISTER COMPANY
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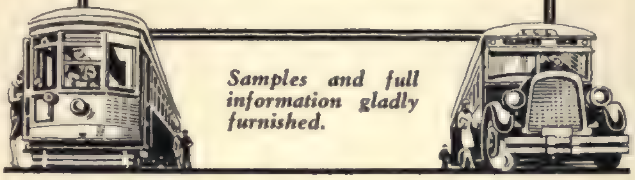

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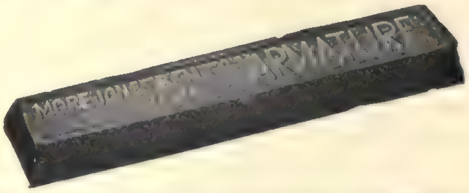

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Special Track Work of every description
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Cars Complete—Low Price—Fine Condition
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SUPERINTENDENT of equipment on an electric traction system maintaining about 600 cars and operating several large carhouse; applicant must have had considerable experience in shop management and in equipment maintenance; some experience in bus maintenance also desirable; must be a good organizer and handle men successfully; give education, practical experience, salary wanted and references in reply which will be held confidential to P-11, Electric Railway Journal, Tenth Ave. at 36th Street, New York.

POSITIONS WANTED

TRANSPORTATION superintendent, broad experience, fine record achievements; recognized ability; successful in handling labor and all details transportation department; a progressive energetic worker, fully capable getting results; high-grade references. PW-10, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

SUPERINTENDENT of railways, with 20 years' experience desires, for personal reasons, to make change. Nationwide reputation as railway operator, can take full charge. Has ability to handle men and show results. Correspondence invited and treated in confidence. PW-979, Electric Railway Journal, 7 So. Dearborn Street, Chicago, Ill.

If there is anything you want—

or something you don't want that *other* readers of this paper can supply—or use—advertise in the

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Somebody is always looking for something to meet certain business needs. Some men in charge of plant operations may be in the market for good used equipment—others may have just what they want, to sell. Some may require a man of unusual qualifications for a particular position—that man may be another reader of this paper!

Put the Searchlight Section to work for you under any of the following classifications—to fill your business needs.

Agencies Wanted
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Contracts To Be Let
Contracts Wanted
Educational Courses
Employment Agencies
Exchanges
For Rent Items
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Industrial Sites
Miscellaneous Wants
New Industries Wanted
Partners Wanted
Patents For Sale
Patent Attorneys
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Property For Sale
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Representatives Wanted
Salesmen Wanted
Work Wanted
Etc., Etc., Etc.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
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Automatic Return Switch Stands
Ramapo Ajax Corp.

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Axles
Bemis Car Truck Co.
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Cincinnati Car Co.
St. Louis Car Co.
Standard Steel Works Co.
Taylor Electric Truck Co.
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Axles, Steel
Carnegie Steel Co.

Babbitt Metal
More-Jones Brass Metal Co.

Babbitting Devices
Columbia Machine Works

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Barges, Steel
American Bridge Co.

Batteries, Dry
Nichols-Lintern Co.

Batteries, Storage
Willard Storage Battery Co.

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Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
More-Jones Brass Metal Co.
St. Louis Car Co.
Taylor Electric Truck Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Columbia Machine Works
Stucki Co., A.

Bells and Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Track-work Co.

Bodies, Bus
Baker-Raulang Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Graham Brothers
St. Louis Car Co.

Body Material, Haskelite and Plymetl
Haskelite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Boiler Tubes
National Tube Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

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Amer. Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
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Westinghouse E. & M. Co.

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American Bridge Co.
Bates Expanded Steel Truss Co.
Columbia Machine Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
Taylor Electric Truck Co.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts
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Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Co.
General Electric Co.
National Brake Co.
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Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Buses
Cummings Car & Coach Co.
Graham Brothers
International Harvester Co.
International Motor Co.
Mack Trucks, Inc.
White Co.
Yellow Truck & Coach Co.

Bushings, Case Hardened & Manganese
Brill Co., The J. G.
Bemis Car Truck Co.
Cincinnati Car Co.
Columbia Machine Works
St. Louis Car Co.

Cables. (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Cambric Yellow and Black Varnish
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Carbon Brushes (See Brushes, Carbon)

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Car Panel Safety Switches
Consolidated Car Heat. Co.
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Car Steps, Safety
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Car Wheels, Rolled Steel
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Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co., Inc.
St. Louis Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.

Cars, Passenger, Freight, Express, etc.
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Kuhlman Car Co., G. C.
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Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
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Anderson Mfg. Co., A. & J. M.
Cincinnati Car Co.
Columbia Machine Works
More-Jones Brass Metal Co.

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
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Catchers and Retrievers, Trolley
Earll, C. I.
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskelite Mfg. Corp.
Pantasote Co., Inc.

Ceilings, Plywood, Panels
Haskelite Mfg. Corp.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Change Trays
Cincinnati Car Co.

Circuit-Breakers
Anderson Mfg. Co., A. & J.
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Columbia Machine Works
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(Continued on page 58)

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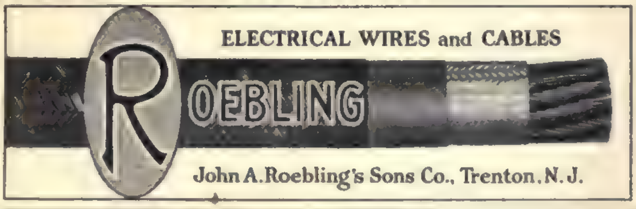
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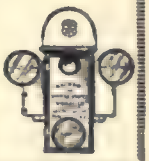

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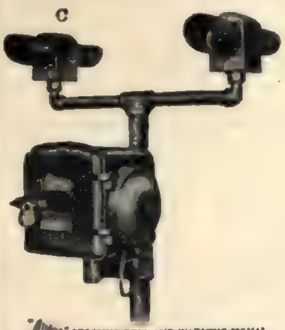
(Continued on page 60)



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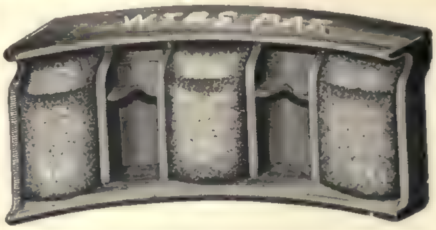

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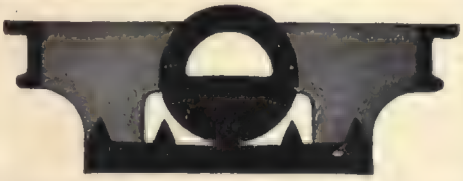

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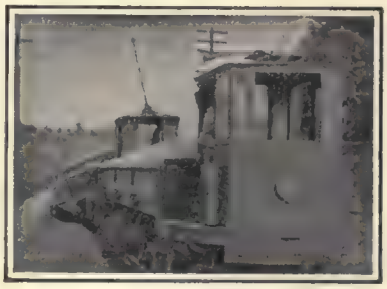

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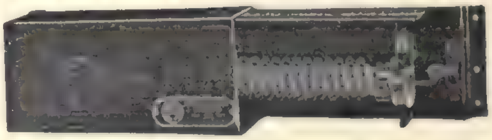

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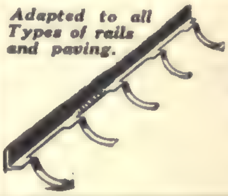

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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page
American Brass Co., The...... 57
American Bridge Co.......... 54
American Car Co............. 61
American Electrical Works.... 57
American Insulating Machinery Co. 59
American Steel & Wire Co..... 57
American Steel Foundries 8
Anaconda Copper Mining Co... 57
Anderson Mfg. Co., A. & J. M.. 48
Archbold-Brady Co........... 54

Babcock & Wilcox Co......... 53
Baker-Raulang Co., The....... 28
Bates Expanded Steel Truss Co. 53
Beeler Organization 52
Bemis Car Truck Co.......... 38
Bethlehem Steel Company 54
Bibbins, Roland J............ 52
Brill Co., The J. G............ 61
Buchanan & Layng Corp...... 53
Buda Co., The............... 53

Cameron Electrical Mfg. Co.... 57
Carnegie Steel Co............. 41
Chillingworth Mfg. Co........ 59
Cincinnati Car Co............. 17
Cleveland Fare Box Co........ 50
Collier, Inc., Barron G........ 47
Columbia Machine Works & M. I. Co. 51
Consolidated Car Fender Co.... 59
Consolidated Car Heating Co.... 53
Cummings Car & Coach Co..... 37

Day & Zimmermann, Inc....... 52
Dayton Mechanical Tie Co., The Insert 43-44
Differential Steel Car Co., The.. 59
Drum & Co., A. L............ 53

Earll, C. I.................. 48
Economy Electric Devices Co..18-19

Page
Electric Equipment Co........ 55
Electric Ry. Equipment Co..... 57
Electric Service Supplies Co... 9

Faile & Co., E. H............. 52
Ford, Bacon & Davis.......... 52
"For Sale" Ads.............. 55

General Electric Co..22, Back Cover
Goodrich Rubber Co., B. F..... 25
Gold Car Heating & Ltg. Co.... 59
Godwin Co., W. S............ 59
Graham Bros. 27
Griffin Wheel Co............. 48

Hale-Kilburn Co. 35
Haskelite Mfg. Corp.......... 54
"Help Wanted" Ads.......... 55
Hemphill & Wells 52
Holst Englehard W........... 52
Hubbard & Co............... 57
Hyman-Michaels Co.......... 55

International Creosoting Co., The. 40
International Harvester Co.... 29
International Motor Co., Insert 31-32-33-34
International Oxygen Co....... 54
International Register Co...... 50
International Steel Tie Co., The. 7
Irvington Varnish & Insulator Co. 50

Jackson, Walter 52
Jeandron, W. J.............. 48

Kelker, DeLeuw & Co........ 52
Kuhlman Car Co............. 61

Page
Lang Body Co............... 55
LeCarbone Co............... 48
Leece-Neville Co., The......... 24
Linn & Marshall, Inc.......... 52
Lorain Steel Co.............. 54

Mack Trucks, Inc., Insert 31-32-33-34
McClellan & Junkersfeld 52
Metal & Thermit Corp........ 36
Mica Insulator Co............ 51
More-Jones Brass and Metal Co... 51

Nachod and United States Signal Co., Inc. 57
National Brake Co............ 23
National Pneumatic Co........ 15
National Ry. Appliance Co..... 53
National Tube Co............ 42
Naugle Pole & Tie Co......... 57
Nichols-Lintern Co., The...... 59
Nuttall, R. D................ 49

Oakite Products, Inc.......... 50
Ohio Brass Co............... 5
Ohmer Fare Register Co...... 49
Okonite-Callender Cable Co., Inc., The 57
Okonite Co., The............ 57

Pantasote Co., Inc............ 51
Perey Mfg. Co., Inc.......... 53
Positions Wanted and Vacant... 55

Railway Track-work Co...... 6
Railway Utility Co............ 59
Ramapo, Ajax Corp.......... 54

Page
Richey, Albert S............. 52
Roebling's Sons Co., John A... 57

St. Louis Car Co............20-21
Safety Car Devices Co........ 16
Samson Cordage Works........ 57
Sanderson & Porter 52
Searchlight Section 55
Smith Heater Co., Peter...... 53
Standard Steel Works Co...... 39
Star Brass Works, The........ 54
Stevens & Wood, Inc.......... 52
Stone & Webster 5
Stucki Co., A................ 59

Taylor Electric Truck Co.... 46
Texas Company, The.......... 45
Transit Equipment Co......... 55

Una Welding & Bonding Co.... 53
Union Switch & Signal Co...... 30
Universal Lubricating Co., The.. 59

Van Loan Corp., Irving S...... 55

Wallace and Co., J. D......... 50
"Want" Ads................. 55
Wason Mfg. Co.............. 61
Westinghouse Elec. & Mfg. Co..2-4
Westinghouse Traction Brake Co. 10
Wharton, Wm., Jr. & Co., Inc.. 54
"What and Where to Buy," 56-58-60
Wheel Truing Brake Shoe Co... 59
White Co., The........Front Cover
White Eng. Corp., The J. G.... 52
Willard Storage Battery Co.... 26
Wish Service, The P. Edw..... 53
Wood Co., Chas. N........... 57
Yellow Truck & Coach Mfg. Co., Insert 11-12-13-14

WHAT AND WHERE TO BUY—Continued from page 58

Stop Signals
Nichols-Lintern Co.

Storage Batteries (See Batteries, Storage)

Strain, Insulators
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Strand
American Steel & Wire Co.
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Street Cars, Passenger (See Cars, Passenger, Freight, Express, etc.)

Superheaters
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Sweepers, Snow (See Snow Plows, Sweepers and Brooms)

Switch Stands and Fixtures
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Switches and Switchboards
Consolidated Car Heating Co.
Elec. Service Supplies Co.
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Switches, Tee Rail
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Switches, Track (See Track Special Work)

Tampers, Tie
Railway Track-work Co.

Tapes and Cloths (See Insulating Cloth, Paper and Tape)

Tee Rail Special Track Work
Ramapo Ajax Corp.

Telephone and Telegraph Wire
American Steel & Wire Co.

Telephones and Parts
Elec. Service Supplies Co.

Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)

Thermostats
Consolidated Car Heating Co.
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Ticket Choppers and Destroyers
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Ties, Mechanical
Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel
American Bridge Co.
Carnegie Steel Co.
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Ties, Wood Cross (See Poles, Ties, Posts, etc.)

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Westinghouse E. & M. Co.

Trolley Buses
Brill Co., The J. G.
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Trolley Material, Overhead
Anderson Mfg. Co., A. & J. M.
Elec. Service Supplies Co.
More-Jones Brass Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Trolley Wheels (See Wheels, Trolley)

Trolley Wheel Bushings
More-Jones Brass Metal Co.
Star Brass Works

Trolley Wire
American Brass Co.
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Varnishes (See Paints, etc.)

Ventilators
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Brill Co., The J. G.
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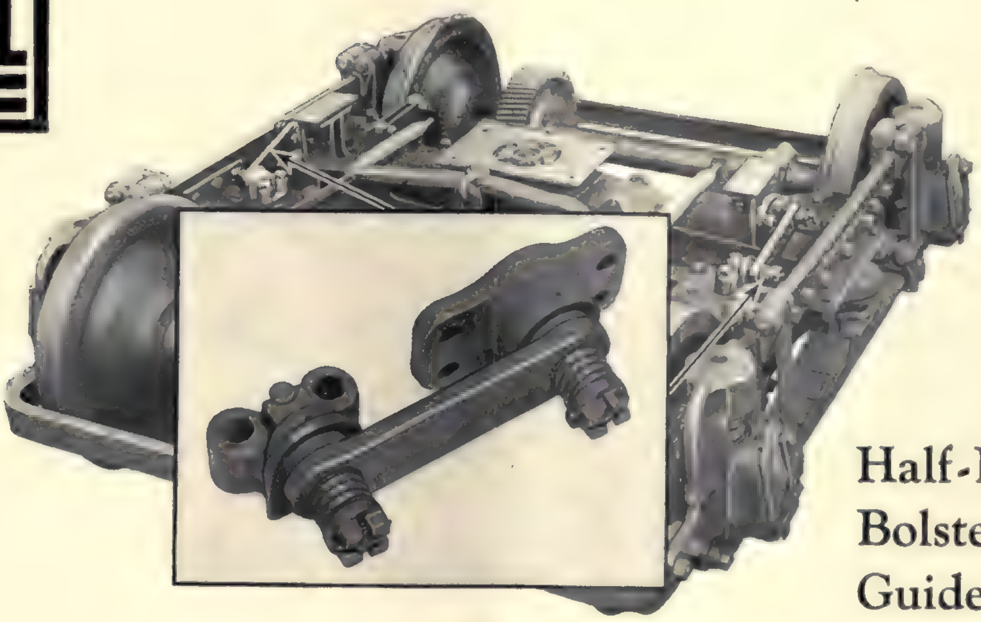

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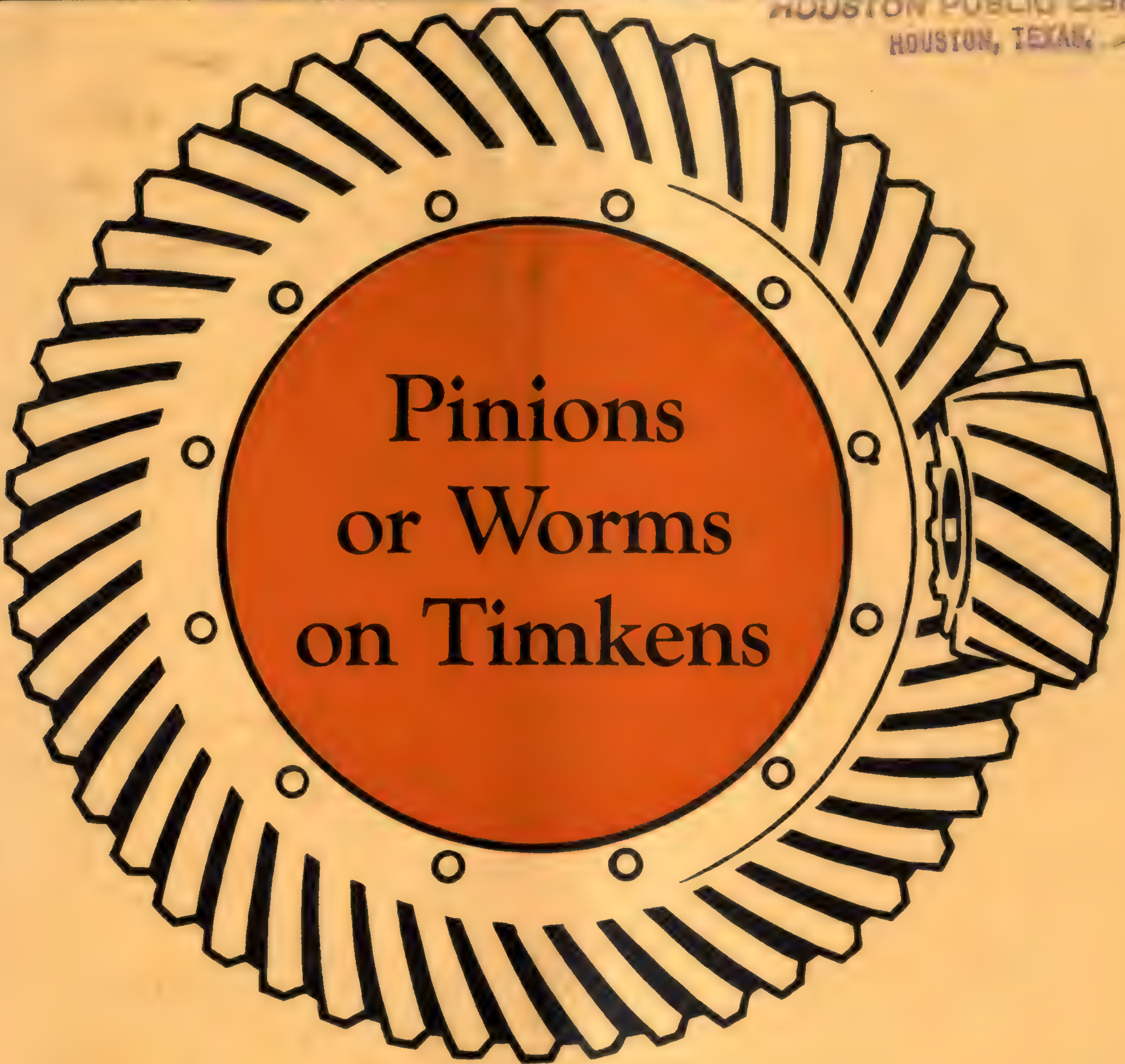

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Pages
1025-1070

CONTENTS

JUNE 11, 1927

Editorials 1025

Zone System Builds Revenue in San Diego......1028

City division includes two zones each with 5-cent fare. Commission of 3 per cent gross sales of tokens, passes and special forms of transportation paid to operatrs.

New Traffic Regulations in Cincinnati..........1031

Car Publicity as They Write It in Georgia......1032

Marching through Georgia with the pen instead of the sword, the Georgia Power Company is selling transportation from practical, emotional and social angles.

Introducing the "West Virginia"...............1036

West Penn Railway buys de luxe car developed especially for Fairmount-Clarksburg limited service. Comfort features attract many new patrons.

Electric Track Switch Protection for Joint Operation 1037

Key System Transit Company and Southern Pacific Railroad have novel system for protecting a short section of track in Oakland, Cal. Both pantograph and trolley wheel contactors are employed.

Ohio Companies Increase Returns from Freight Hauling 1039

Revenue Increased by Co-ordination of Bus and Car Service 1039

Route changes recently made by Public Service Railway have eliminated duplication in Harrison and Kearny. Transportation is furnished to additional territory.

Convenient First-Aid Packet 1040

Keeping Cars Attractive at Small Cost..........1041

By Pierre V. C. See.

Frequent painting, use of spray methods where possible, efficient apparatus so that cars can be washed daily and a definite program to adopt improved devices have produced good results at Akron.

Rochester and Syracuse Cars Made More Attractive 1044

Los Angeles Railway Shops Modernized........1045

Machine tools have been changed over to individual motor drive and modern switching equipment has been installed. Particular attention has been given to provide a light, new shop.

Maintenance Notes 1047

Association News and Discussion...............1050

Winnipeg Welcomes Canadians..................1050

Choice of Alloy Trolley Wires..................1052

By J. F. Neild.

One-Man Fare Collection on Suburban and Interurban Railways 1053

By H. E. Weymen.

Economies in Power Distribution...............1054

By A. J. Westman.

Development of Miscellaneous Revenue........1055

By W. H. Boyce.

American Association News 1056

American Executive Committee Meeting.........1057

News of the Industry.........................1058

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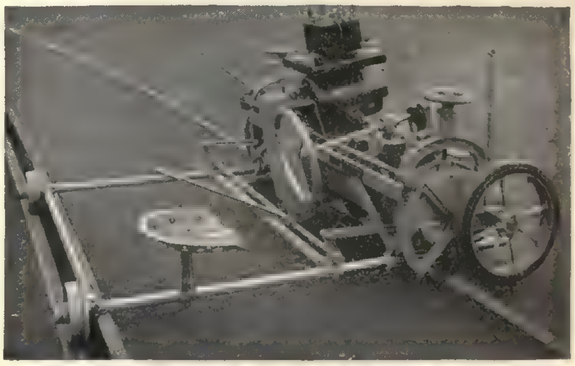
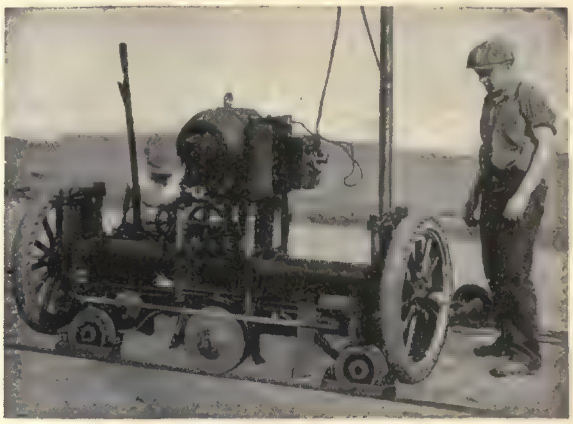


"Improved Atlas" Rail Grinder



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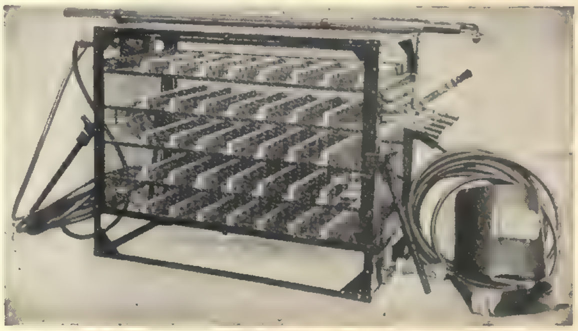

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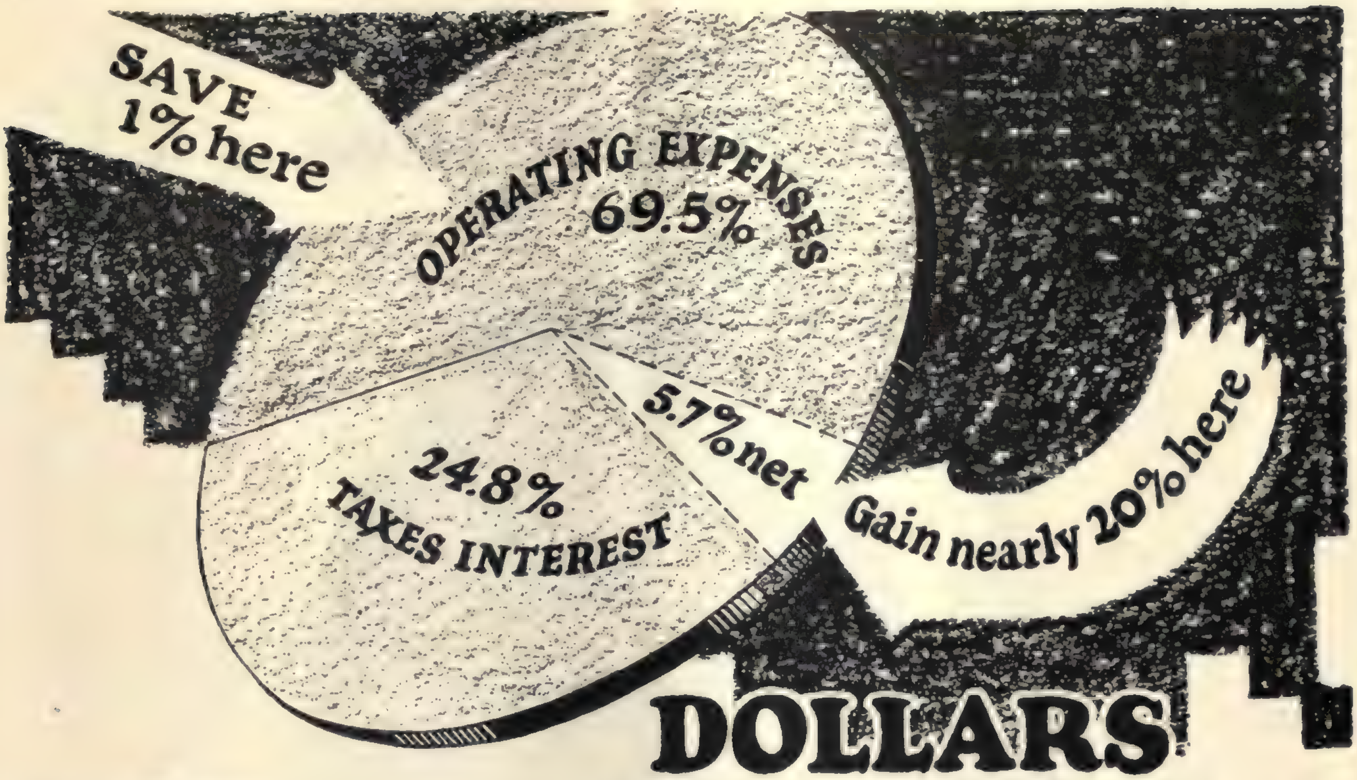

DOLLARS AND SENSE!

Marathon Ear
catalog page 534

Type C Splicer
catalog page 542

Renewable Bronze Cam Tip
catalog page 578

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catalog page 573

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catalog page 579

Spring Lock Hanger
catalog page 465

Lock Hanger
catalog page 467

Section Insulator
catalog page 557

STATISTICS of the industry as a whole reveal a split-up of the average fare as illustrated above. The net income is only 5.7%. Just one percent saved from the 69.5% now devoted to operating expenses would make the net 6.7%—an increase of nearly 20%.

This is but another way of reminding ourselves that big things are often accomplished by the total of many little things well done.

Savings in line maintenance alone, can contribute a substantial share toward the one or two percent desired to enhance the net income.

O-B Line Materials cut maintenance costs. Their records of performance on scores of properties have definitely proved their ability to increase net income.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada

Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

The "One-Wear" Steel Wheel Idea

BASICALLY the "One-Wear" Steel Wheel idea was to find a wheel material that would combine the quality of high resistance to wear with strength.

This high wear resistance would eliminate the need of wheel re-turning and permit the use of a lighter wheel.

The Davis "One-Wear" Steel Wheel is the culmination of this idea. It is made of a special heat-treated steel that develops the desired characteristics. It is the material of which the Davis "One-Wear" Steel Wheel is made that makes it truly "One-Wear."

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

Ask me another !—

Q. What percentage of total rail base is carried by Twin Ties?

A. 50%.

***

Q. What are Twin Ties made of?

A. *Entirely* of steel.

***

Q. What about installation labor costs?

A. Usually about 50% less than to install wood ties.

***

Q. What about track foot cost, installed?

A. As much as $1.50 saved per track foot laid.

***

Q. How long will Twin Ties last?

A. Practically forever.

***

Q. But the rails wear out!

A. Yes—and Renewal Twin Ties may be laid right on the old foundation.

***

Q. Who uses Twin Ties?

A. Detroit, Cleveland, Toledo, Boston. Philadelphia, Washington, Cincinnati, Kansas City, Baltimore, Atlanta, Akron, Binghamton—a couple hundred in all.

***

Q. Where can I get complete information on all kinds of paved track construction?

A. From the Paved Track Notebook.

***

Q. Who publishes it?

A. We do.

***

Q. Will you send me one?

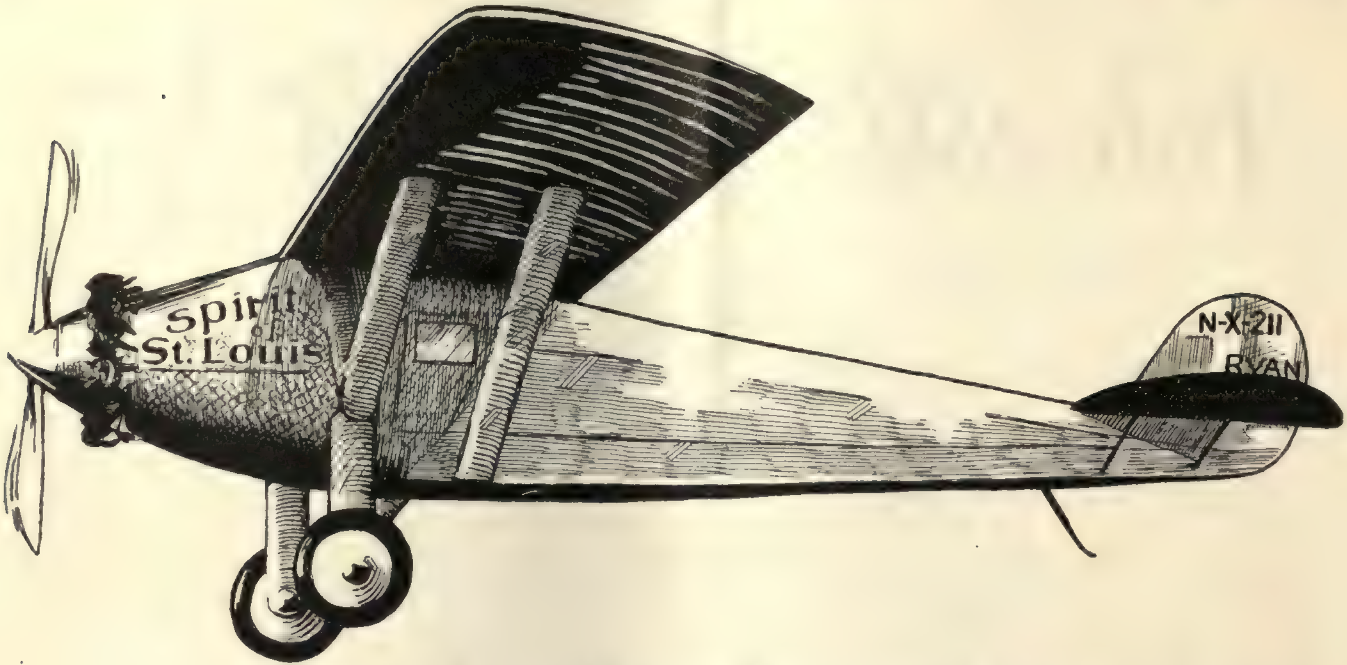
A. Righto—just sign on the dotted line.

The International Steel Tie Co.
Cleveland, Ohio

The International Steel Tie Co.,
Cleveland, Ohio
Gentelmen:
Here's my signature on the dotted line—send me a Paved Track Notebook.
....
....
....
....

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track



Lindbergh—New York to Paris

Byrd—North Pole

Chamberlin—New York to Berlin

and the every day flights of fearless flyers in Government Mail, Army and Navy service.

SCINTILLA AIRCRAFT MAGNETOS

The planes of Lindbergh and Chamberlin were both propelled by Wright Whirlwind Motors, regularly equipped with Scintilla Magnetos. The Scintilla Magneto Company is a subsidiary of American Brown Boveri.

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Camden, New Jersey
922 Witherspoon Bldg., Philadelphia
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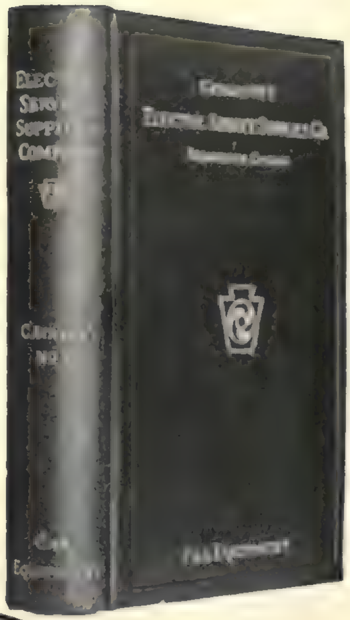
230 South Clark St., Chicago

AMERICAN BROWN BOVERI



ELECTRIC SERVICE SUPPLIES COMPANY

Keystone Rotary Gongs

ELECTRIC SERVICE SUPPLIES COMPANY

DESIGNED for giving at a slight pressure of the foot from one to fifteen strokes—regulated at the will of the operator. This loud and distinct alarm provides an effective warning even in noisy surroundings. Such gongs are merely common-sense protection for equipment and passengers in these days of congested and noisy traffic.

Regardless of whether yours is a remodeling program or a new car building program, in ESSCO Catalog No. 7 you will find a complete line of Keystone Car Specialties that provide for increased attractiveness, comfort, convenience and safety.

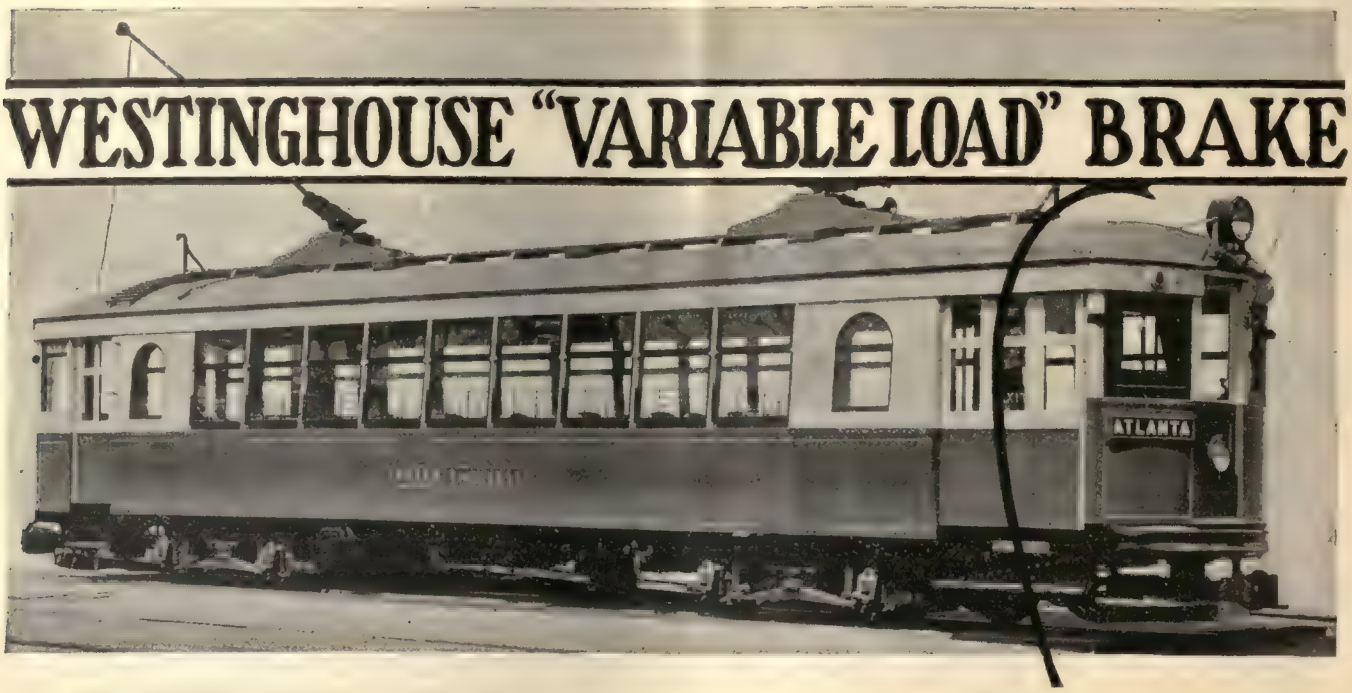
Let us send you ESSCO Catalog No. 7.

ELECTRIC SERVICE SUPPLIES COMPANY
PHILADELPHIA, 17th & Cambria Sts.; NEW YORK, 50 Church St.; CHICAGO, ILL., Merchants Bank Bldg.; Pittsburgh, Bessemer Bldg.; Boston, 88 Broad St.; Detroit, General Motors Bldg.; Scranton, 316 N. Washington Ave.; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

WESTINGHOUSE "VARIABLE LOAD" BRAKE



gives
Uniform Braking
with
Varying Load

STABILIZED STOPABILITY throughout the entire range of car-loading means—

—safe and swift car movement, through congested districts;

—ability to hold traffic position with other moving vehicles, inasmuch as peak speed can be held longer between stops;

—a precise and systematic movement of shopping and business crowds;

—seconds saved, that may collectively be counted as dollars;

—stimulation of public good will, through a gratifying on schedule record over the entire system.

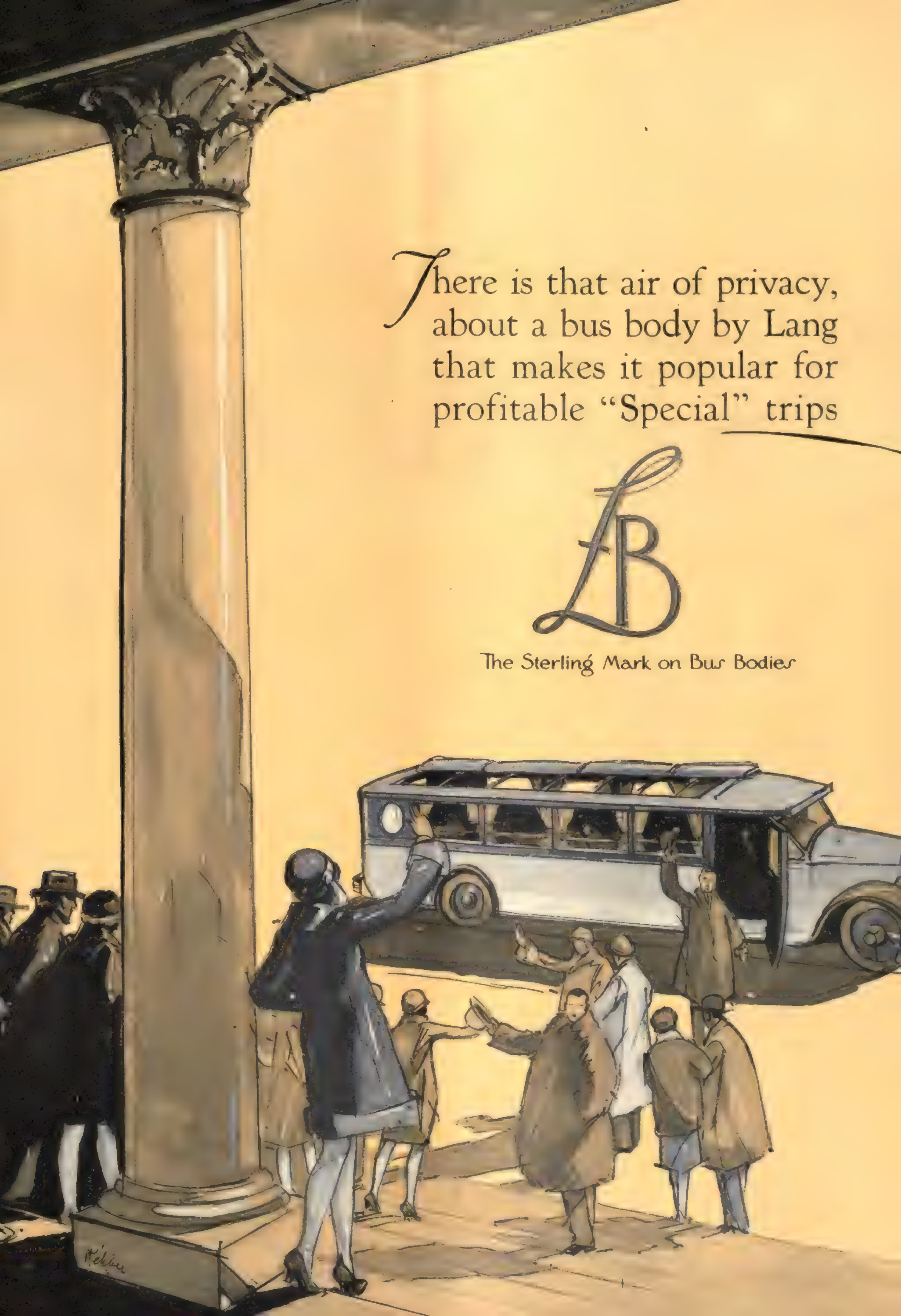
Many traction companies, recognizing the auspicious part Westinghouse Variable Load Brakes can play in effecting these far-reaching advantages, are specifying this new type equipment for their new modern light weight cars.

Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office—

Ask for Descriptive Catalogue T-2045.

Westinghouse Traction Brake Company
General Offices and Works: Wilmerding, Pa.

WESTINGHOUSE TRACTION BRAKES



There is that air of privacy, about a bus body by Lang that makes it popular for profitable "Special" trips

The Sterling Mark on Bus Bodies

LANG BODIES

create new passengers

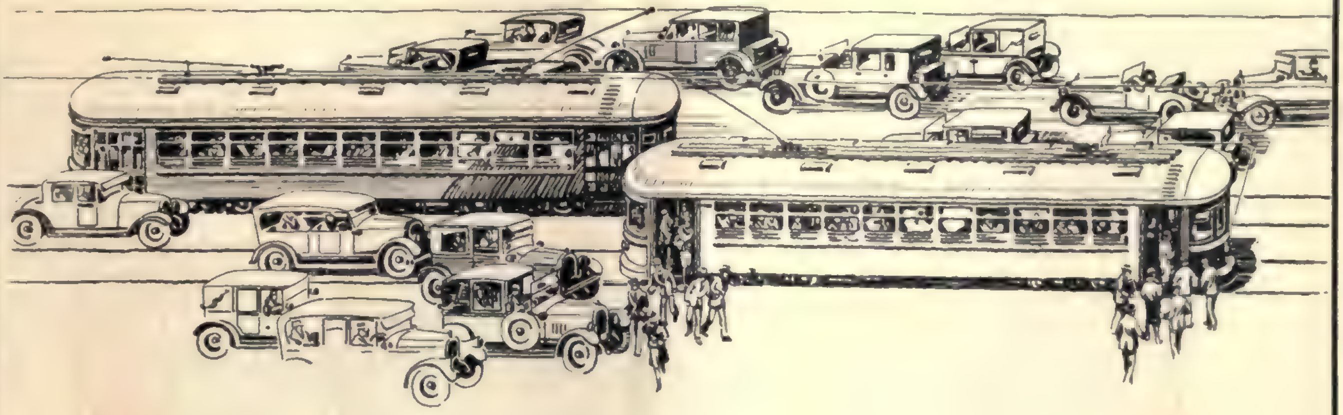
PASSENGERS appreciate the atmosphere of privacy which surrounds them in a Lang Body. Luxuriously upholstered seats, wide clear-vision windows, artistic metal-ware and trim, all contribute to the sense that everything is planned for the personal comfort and convenience of the individual.

What the passenger does not see is the sturdy super-skilled body construction that lies beneath the finish, in which every joint and truss is designed and put together to add many miles to the life of the body.

THE LANG BODY COMPANY, CLEVELAND, OHIO

*"After all—
it's the Setting
that counts!"*

LESS STREET SPACE PER PASSENGER THAN ANY OTHER VEHICLE



NP

THE street car carries more riders per square foot of passenger space and occupies street space for a shorter length of time than any other vehicle.

NP Door and Step Equipment has been of material aid in establishing this fact. By providing a more even distribution of load it has helped utilize car space to the fullest extent and, by effecting a more speedy interchange of passengers, it has reduced standing time and helped to keep traffic moving.

"Streets are for moving traffic, not for storage."

NATIONAL PNEUMATIC COMPANY

Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

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1010 Colonial Trust Building

"We Like Cincinnati

New Cars *very much”*

“...We find that they accelerate and decelerate quickly, and save power ...”

Speed and acceleration in tune with a twentieth century public's ideas of good service. Stopping ability to make the most of this speed in traffic, and to meet all safety demands on long-distance runs.

These indeed are key features of cars built to the principle of BALANCED DESIGN. They are the direct result of *true* lightweight construction, in which every detail of car-body, trucks, suspension and braking has been accurately balanced to meet definite operating conditions.

The Portsmouth Public Service Company, quoted above, feels that its Cincinnati NEW Lightweight Cars have played a very definite part in helping to promote public goodwill and to retain substantial patronage during years of keen competition with the private automobile. After all Balanced Design works deliberately to just this end, . . . to produce cars so thoroughly modern in appearance, in comfort and in operating characteristics as to assure favorable public attention and to guarantee operating economy.

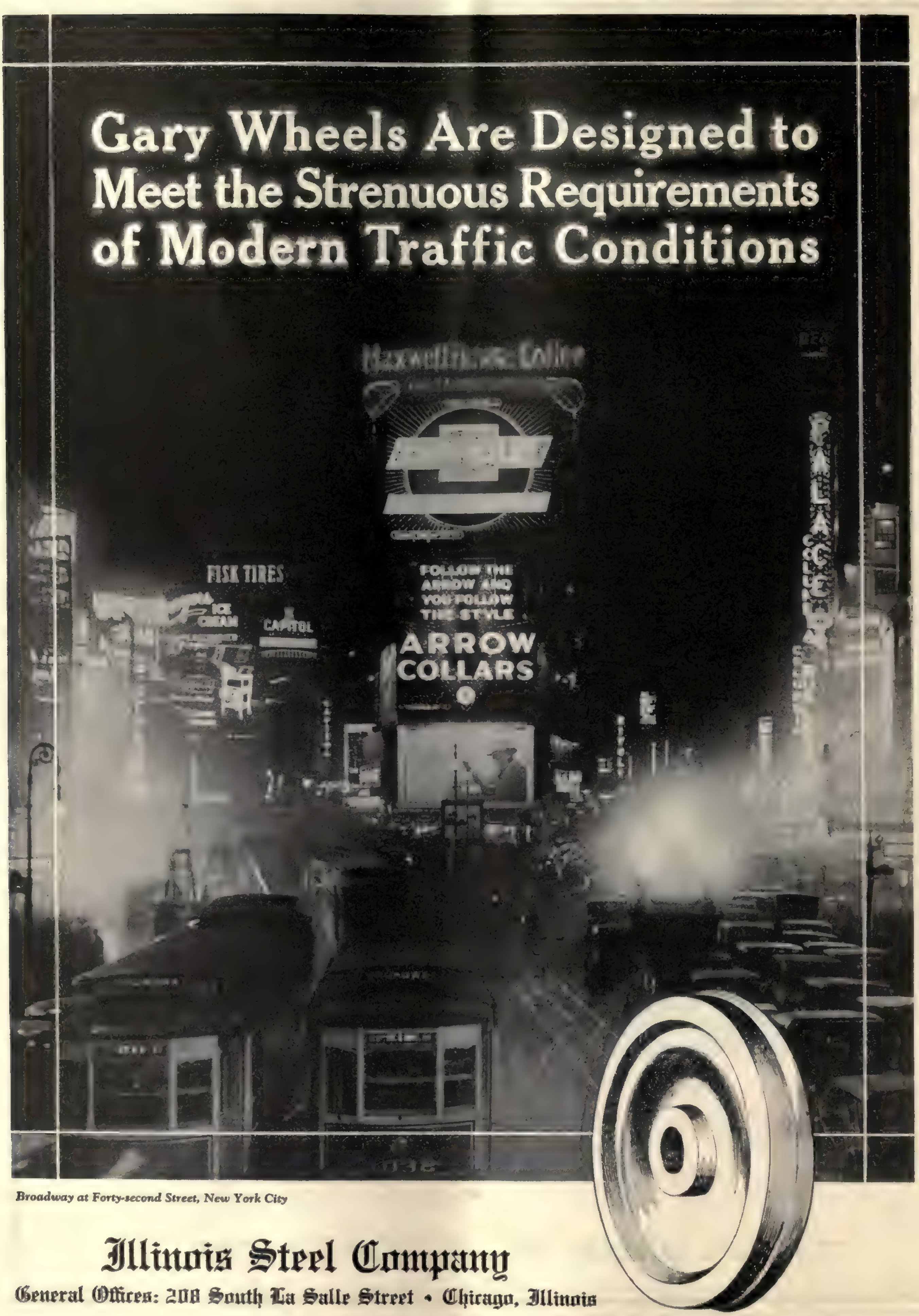
Every installation of Cincinnati NEW Cars made to date has been successful. Your property is not likely to prove an exception.

We'll be glad to discuss the matter further if you are interested. Please write us.

CINCINNATI CAR COMPANY
Cincinnati, Ohio

CINCINNATI
New
CARS

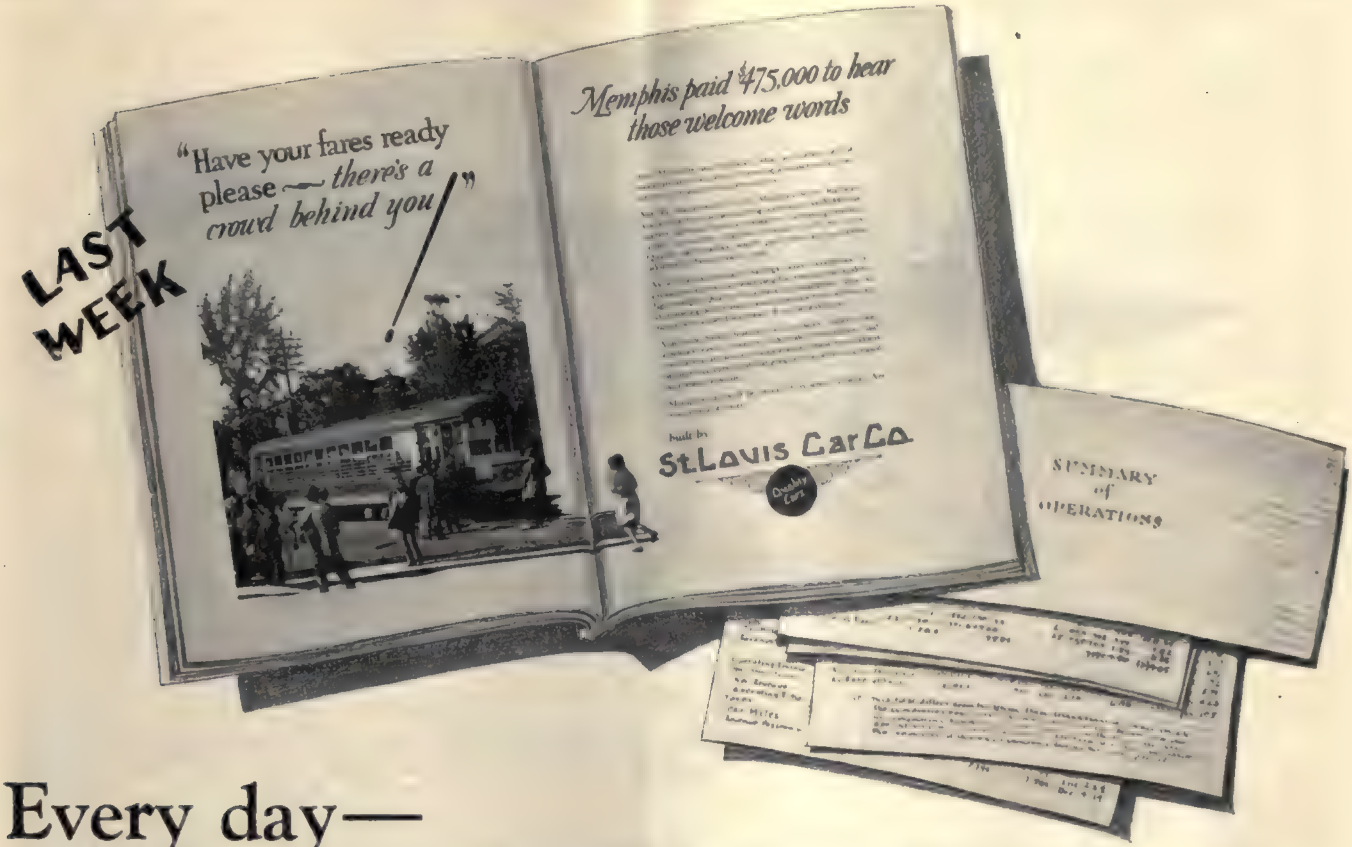
~A step ahead of the modern trend


Gary Wheels Are Designed to Meet the Strenuous Requirements of Modern Traffic Conditions
Maxwell House Coffee
FISK TIRES
ICE CREAM
CAPITOL
FOLLOW THE ARROW AND YOU FOLLOW THE STYLE
ARROW COLLARS
PALACE

Broadway at Forty-second Street, New York City

Illinois Steel Company

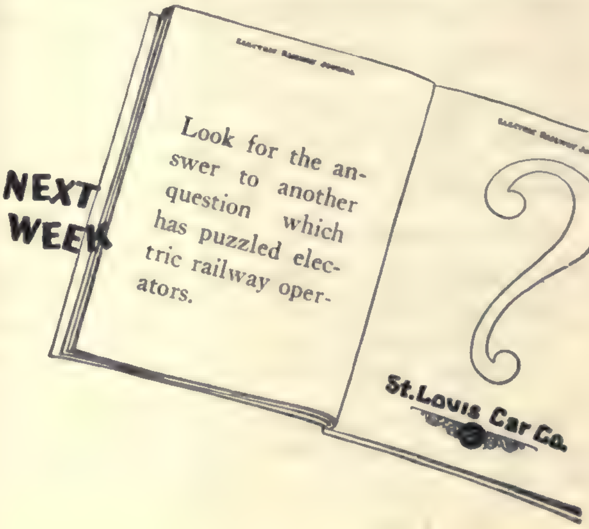
General Offices: 208 South La Salle Street • Chicago, Illinois


LAST WEEK
"Have your fares ready please — there's a crowd behind you!"
Memphis paid $475,000 to hear those welcome words
built by
St. Louis Car Co.
Quality Cars
SUMMARY of OPERATIONS

Every day—

reports continue to come in, which bear witness to this significant fact—that every property thus far modernized in whole or in part finds that it costs less to buy new, light weight car equipment than it does to operate old cars.

St. Louis has enlisted in the cause of modernization. Make it your ally in your fight to regain profitable operation and public favor.



Look for the answer to another question which has puzzled electric railway operators.

St. Louis Car Co.

Quality Cars

CONGRATULATING —
Captain Charles Lindbergh on his heroic achievement

With the indomitable courage of a true hero and with profound faith in the excellence of the Wright engine which propelled his Ryan plane, Captain Charles Lindbergh made his epochal non-stop flight from New York to Paris.

During every minute of his journey, through sleet storm and under maximum engine stresses, Captain Lindbergh's successful trip, and probably his life, depended upon the perfect functioning of all motor parts.

Bethlehem drop forgings are a part of this famous engine. They did their work efficiently and proved again the excellence of quality and workmanship of Bethlehem products.

The Bethlehem organization is happy to have contributed to the success of Captain Lindbergh in his epochal and heroic accomplishment.

BETHLEHEM STEEL COMPANY
General Offices: BETHLEHEM, PA.

DISTRICT OFFICES:
New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh
Buffalo Cleveland Detroit Cincinnati Chicago St. Louis San Francisco
Los Angeles Seattle Portland

Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of Our Commercial Products

BETHLEHEM

Bethlehem Alloy Steel Forgings used in Lindbergh's Engine

The following parts, made of Bethlehem Alloy Steel Drop Forgings, stood the test with Captain Lindbergh:

Master Connecting Rod
Articulated Connecting Rods
Inlet and Exhaust Cam
Inlet and Exhaust Valve Rocker Arms

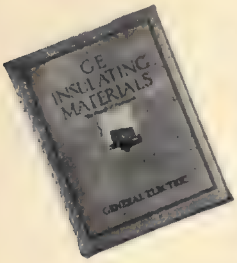
These parts were forged from 3½% nickel and nickel-chrome alloy steels.

◆ ◆ ◆

GOLD MEDAL AWARDS received by Bethlehem at the recent Sesqui-Centennial Exposition, Philadelphia, in recognition of the high quality of Bethlehem Alloy Steels and Drop Forgings, are further evidence of the excellence of these products.

It's the answer for your car cables

G-E Paragon Tape is weatherproof. It does not obstruct the passage of varnish and treating compounds and in this respect is superior to rubber-filled friction tape. Use it for street car cables, to protect exposed insulation and for splicing outside joints. The men who use it will appreciate the fact that it is packed carefully to make it easy to handle without waste.



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GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT

Modernize -

refer to these three books

"Modernize", the operating slogan of today, has at least three applications: Modernize equipment, maintenance, and methods. To help attain these objects, modernize your railway library.

General Electric has compiled three books of highest practical value in *modern* railway operation.

FIRST: Complete Catalog of Railway Supplies. This is an index of modern standards. Use it as a helpful guide to the selection of supplies and equipment.

SECOND: Renewal Parts Catalog compiled individually for each railway company. It lists, describes, and offers duplicates of every equipment part. Use it to assure original equipment quality in maintenance.

THIRD: Maintenance Data Book. This is a compilation of practical experience. Use its suggestions as to the most economical and efficient ways of maintaining equipment and of making repairs or replacements.

Have you this three-book shelf at hand? If so, do you keep it to date by inserting each addition that General Electric sends you?

330-62

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 11, 1927 *Number* 24

The Bigger the "If" on the Clubhouse Door the Lower the Score

WITHOUT confidence in one's own team, victory is impossible. And in business, just as in sport, confidence and enthusiasm are essential to success. A question mark in the manager's mind is soon reflected throughout the organization.

"What is the most important need of the electric railway industry?" some one asks. Above all else it seems to be confidence in the possibilities of his own industry on the part of the railway executive.

Is such confidence justified or is the industry merely whistling to keep up its spirit? The answer is simple. The arteries of transportation are the very life streams of the community. Property values are built on transportation. The value of a piece of property for business purposes depends on the number of people who pass it daily. Those people are brought there by the community's transportation system. The transportation is not only necessary, it is vital.

Then what, if anything, is the matter with the transportation industry? Public misunderstanding? Yes. Lack of co-operation by public officials? Yes. But these conditions exist only in some cities. In many others they did exist but have been eliminated. In few instances did the public or its representatives take the initiative. It is not to be expected that they will. That is the responsibility of the railway executive. In some cases a radical change in his own point of view is necessary before real progress can be made.

Whatever the Vehicle, the Principle Remains the Same

MEN who go down to the sea in ships are rightly supposed to be a shrewd and sagacious clan. Experience has taught them to be sure whither a new course, be it one of adventurous sailing or of a change in management policy, leads before they embark on it. Hence the present widely adopted policy of replacing old ships by new ones has a significance extending far beyond the shipping industry itself.

Today the world has about 30 per cent more ships than in 1913, while the volume of world trade is estimated at about 20 per cent less than it was before the war. Yet shipbuilding continues at a good rate. This is explained by the superior efficiency and attractiveness of the new ships. It has been found that they pay for themselves.

While differences are numerous between transportation by water and transportation by rail, the principle of increasing revenue by improving equipment is the same. Today there are probably enough electric railway cars available to carry the present traffic, but many of them are woefully out of date. They are costly to operate and are poor business getters. Progressive railway men, like the shrewd ship owners, have discovered it pays to replace obsolete equipment with the best that modern science can supply. This cannot be done in a day, or a week, or a month, but the movement in this direction is steadily gaining momentum.

Study the Human Element If You Would Build for Permanency!

OWEN D. YOUNG, chairman of the board of the General Electric Company, has the rare gift of specific expression in that he saves his hearers the effort required to translate words into thought. That is the principal reason why the speech made by him on June 4, at the dedication of the new building of the Harvard Graduate School of Business Administration, has attracted so much attention. He repeated some of the things he had said before about the need for a cultural wage, but he said some other significant things which reflect the attitude of big business toward the problems before it, and show the methods used by big business in rising to meet its opportunities.

Advantage can be taken of these opportunities only as the oldest of the arts and the newest of the professions thinks in terms of human beings. It certainly is true that the area of conflict between capital and labor is gradually being reduced. Many things are being learned, and not the least important among them is that low wages for labor do not necessarily mean high profits for capital. Time and brawn alone are not factors by which the barometer of productivity can be forecast. As Mr. Young made plain, the problem today is to deal with the limits within which men may work with zest and spirit and pride of accomplishment. When zest departs, labor becomes drudgery. When exhaustion enters, labor becomes slavery.

However complete the scheme of management may be which takes these things into account, it still fails of its purpose if it does not contemplate that the employee shall share in management through participation by him in ownership. Only in that way is it to be expected that the employee will use capital truly as a tool and be interested in turning it to the highest economic advantage. The hope expressed by Mr. Young was that the day may come when the great business organizations will truly belong to the men who are giving their lives and their efforts to them, no matter in what capacity.

Some of these things sound sensational only because not all of us are as yet attuned to the ideas of the new morality in business which has for its goal that we shall dispose, once for all, of the charge that in industry organizations are autocratic and not democratic. All this is unusually significant. It is not idealism run rampant. The promulgation of the doctrine comes from a man who as the head of one of the greatest business organizations in the world has witnessed the favorable results that have followed the application of the policies he preaches.

The spread of education, with its intensification of inquisitiveness and sensitiveness, has raised men to a higher ethical plane and increased their ability to appraise things properly in the light of their long-time value, while, as has been made plain before, new discovery in pure science, every enlargement of the industrial horizon, every new material put into the hands of humanity, has renewed the demand for the highest type of business management.

The ultimate object mentioned by Mr. Young, that we shall have no hired men, is a long way off, but the time is rapidly coming when ability merely to be shrewd, if it really is ability, will no longer be the *sine qua non* of success. The demands of the times for executive talent transcend any such narrow confines. This the dedication of the new building at Harvard proves. It is important to create a business heritage, but it is much more important so to build in creating it that its perpetuity may be assured. And perpetuity can be reasonably assured only as business carries on along the far-sighted lines Mr. Young has outlined—lines that contemplate the building of men with a stake in the enterprise fitted to assume greater and ever greater responsibilities.

Encouraging News on Taxes

ENCOURAGING news has come from within the classic walls of the treasury building in Washington. As the fiscal year draws to a close, we are informed that there is certainty of another large treasury surplus and of a substantial reduction in the amount of public debt. This is considered as indicative of a further tax reduction by the next Congress.

Internal revenue collections for the first ten months of the fiscal year were about $13,500,000 larger than the amounted collected a year ago, an increase of $228,200,000 in income tax collections having been nearly offset by a decline in receipts from miscellaneous taxes. "On the first of these figures," says the *Guaranty Trust Survey* of New York, "it is estimated by Treasury officials that the surplus for the twelve months will exceed $500,000,000. The actual surplus for the year ended June 30, 1926, was $377,000,000."

It is universally accepted that the only two certain things in this life are death and taxes, likewise that relief from the latter is always a matter of conjecture. Conjecture in this case is encouraging and centers around the probable reduction in the income tax on corporations. This tax, which was increased in the last revenue law, has been criticised very freely by business men and on account of lack of harmony with the general principles of income taxation. In addition, automobile and other excise taxes are likewise unpopular and may be reduced or repealed.

In the *Survey's* general prediction is included the statement that "there appears to be a growing sentiment throughout the country in favor of drastic reform in state and local expenditure." As the JOURNAL has pointed out from time to time the necessity for some relief from the present loose policy in public expenditures, it is indeed heartening to hear that the American taxpayer is at last alive to the seriousness of the situation. No corporations have suffered more from taxes than those which have the great task of transporting millions of the country's workers to and from work, to say nothing of providing the public with a cheap and efficient means of recreation—all of which has been done with this great financial millstone retarding their progress. Consistent effort, then, should be employed to make the anti-public expenditure sentiment grow. It is a plain case of self-preservation.

One-Man Car Operation Has Had Remarkable Growth

INCREASE in the number of one-man cars in operation today over the number operated a few years ago is one of the striking changes that have occurred recently in the electric railway industry. According to the JOURNAL'S latest figures there are about 750 electric railways with 80,000 passenger cars in the United States. Of this number some 20,000 cars, or approximately 25 per cent, are arranged for one-man operation. In the total number of electric railway passenger cars, however, is included a considerable amount of rapid transit equipment, trail cars and rolling stock not in daily use. The one-man cars therefore represent a somewhat larger part—possibly as much as 40 per cent—of the number of ordinary street and interurban cars in regular service.

Proportionately more one-man cars are operated in cities of less than 500,000 population than in the twelve cities in this country that are credited by the 1920 census with a population above that figure. In these twelve largest cities there are only about 4,000 one-man cars and nearly 20,000 two-man cars. Most of the former are operated in outlying sections or at night and on Sundays. Often they are operated by two men on heavy traffic routes during the day. San Francisco is the only city in this group where no one-man cars are in service. It is noteworthy, however, that the proportion of one-man cars is much greater in some of these large cities than in others, and it does not appear that the mere size of the city is a serious obstacle to one-man operation.

In Newark, N. J., a city of more than 400,000 people, all cars are one-man operated. This is true also in Jersey City, N. J.; Worcester, Mass.; Springfield, Mass; Paterson, N. J., and Camden, N. J., cities having between 100,000 and 300,000 population. The Eastern Massachusetts Street Railway, which is second only to the Public Service Railway of New Jersey in the number of one-man cars operated, serves four cities of more than 100,000 population, as well as many smaller communities. Neither of these companies operates any two-man cars. Numerous other railways are also on a 100 per cent one-man basis.

Because of the necessity in the South of separating white and negro passengers, the one-man car came into use more slowly there than in other sections of the country. Nevertheless it has been adopted to a considerable extent by the railways in Atlanta, Birmingham, Memphis, Richmond, Savannah, a number of Texas cities and elsewhere. Indications are that its use will become more general there as time goes on.

Substantial economies are obtained as a result of one-man operation. With wages around 50 to 60 cents per hour, and an average of 10 m.p.h., the saving approximates 5 cents per car-hour despite certain small additional expenses. Experience has shown that the accident hazard with one-man cars is no greater than with two-man cars. Schedule speed remains about the same. Well-designed one-man cars have proved popular with the riding public in many communities. Thus there is every prospect that the remarkable growth of the past few years will continue for some time to come.

Great Inland Empire System Under Trunk Line Auspices

SPOKANE, the center of the so-called Inland Empire System, was always proud of that property, which has recently passed to ownership by the Great Northern Railroad. It might be asked, of course, how, under these circumstances, it came about that the system was permitted to fall upon evil days. That is not quite so easy to answer, except in so far as the changed economic status of the property with the coming of the private automobile affords an answer.

The property was typical of the West. It was conceived liberally and carried to fruition the same way. For a long while it was moderately successful, but the price that was paid by the old owners was not one that could have been foreseen by even the most astute. That, however, is neither here nor there. Now the lines pass to one of the great trunk systems, destined no doubt for a career that the original promoters never dreamed. The Great Northern will, of course, tie in the lines with the rest of its system and so increase the usefulness of this 170-mile system. That the lines are in some sense strategic in the Great Northern scheme of things is beside the point. Their identity may eventually be lost in the larger significance of the Great Northern, but the fact remains that the original promoters of the line were men of vision who did more for the upbuilding of the communities that the road served than they ever did for themselves.

In the impending loss of their individual identity by the lines of the Inland Empire System there is more than a meed of satisfaction that their purchase and use by the Great Northern as electric feeders are in keeping with the general program of electrification of the company in the Pacific Northwest.

Posters on Poles Are Unsightly and Dangerous

PLACING advertising posters or placards on electric railway poles in the public streets is an objectionable and dangerous practice, difficult for the companies to stamp out. Where tubular steel, fabricated or reinforced concrete poles are used, less annoyance of this kind is experienced. Usually the advertiser finds it too much trouble to attach his placard to one of these poles. But many wood poles are still in use in city streets and along interurban lines. No ingenuity, and comparatively little effort, is required to place a placard on a wood pole. Some tacks and a few blows of the hammer are sufficient. Hence the habit of defacing poles in this way is widely prevalent.

From the railway standpoint this practice is doubly objectionable. It mars the appearance of the company's equipment, and creates a certain hazard to the men who are obliged to climb the poles in the course of their duties. The tacks used to fasten advertising material to the pole are likely to prevent the lineman's spurs from taking hold, thus causing him to slip and fall to the ground. Several accidents of this kind have been reported recently.

In some states the use of poles for this purpose is forbidden by law. Even where this is not done, the advertiser has no right to place placards on railway property without the consent of the company. The best way to combat the practice is to have all railway employees keep their eyes open for posters on poles, and to inform the management whenever any are found. The company can then have them removed and notify the advertiser to discontinue the practice, or appropriate legal action may be taken if required.

Will Traffic Congestion Force More Organized Street Use?

TRAFFIC congestion is a community problem as serious as any with which the modern city has to contend. All measures so far devised have failed to show the way toward permanent relief. Even the enormous expenditures for street widening which have been made in many cities have proved inadequate in the face of the constantly growing demand for street space.

Fundamentally, every individual in a community has a right to the free use of the streets. This right exists, however, only as long as its exercise by one individual does not interfere with the rights of others. When the free exercise of individual rights causes general inconvenience, danger and loss, then the needs of the community take precedence over individual right.

Relief of congestion is in a large sense a social problem. Social changes take place very slowly, particularly when they involve curtailment of the individual's rights. Progress is possible only after public opinion has been aroused to appreciation of the need for action. This will come in time. Public opinion is being aroused rapidly to the evils of parking in congested streets. It is recognized that the necessity of the many must take precedence over the convenience of the few.

Restriction, or elimination of parking, however, is not the whole solution for congestion. True, it cuts down the use of individual transportation, and in that respect helps the community and the public transportation companies. But the ownership of individual cars is widespread. They cannot all be classed as a luxury. In some cases they are a distinct convenience—even a necessity—when congestion does not largely restrict their usefulness. Due consideration must be given to this phase of the question if relief from congestion is to be obtained on a fair and equitable basis.

Regulation of traffic movement has nearly reached the limit of its possibilities in some cities. The next logical step seems to be organization. The period of maximum utilization extends over only a relatively small part of the 24 hours. During those periods public transportation, individual transportation and commodity movements are all at their peak. Even this does not adequately describe the situation. Vehicles move hither and yon, crossing, overlapping, some empty and some full. Thus, despite the limited street facilities, there is enormous waste in their use.

A railroad is in a sense comparable to a highway or a city street. It is an artery for the movement of passengers and commodities. If the rail line were operated in the wasteful way which characterizes our streets its capacity would be enormously reduced. The difference in usage today is the difference between organized use and unrestricted individual use.

Then, also, there is the freight vehicle which uses the streets and which is essential to the welfare of the community. Adequate recognition must be given to the movement of commodities in any scheme of congestion relief. To make this relief permanent and equitable, each factor in transportation must be given consideration in proportion to its importance to the community. Only when the problem is approached from this angle will the interests of the community be served best.

City operation of the San Diego Electric Railway is over two zone divisions, in each of which a 5-cent fare is collected. The equipment used is of modern type with double folding doors front and rear. The car is operated by one man.

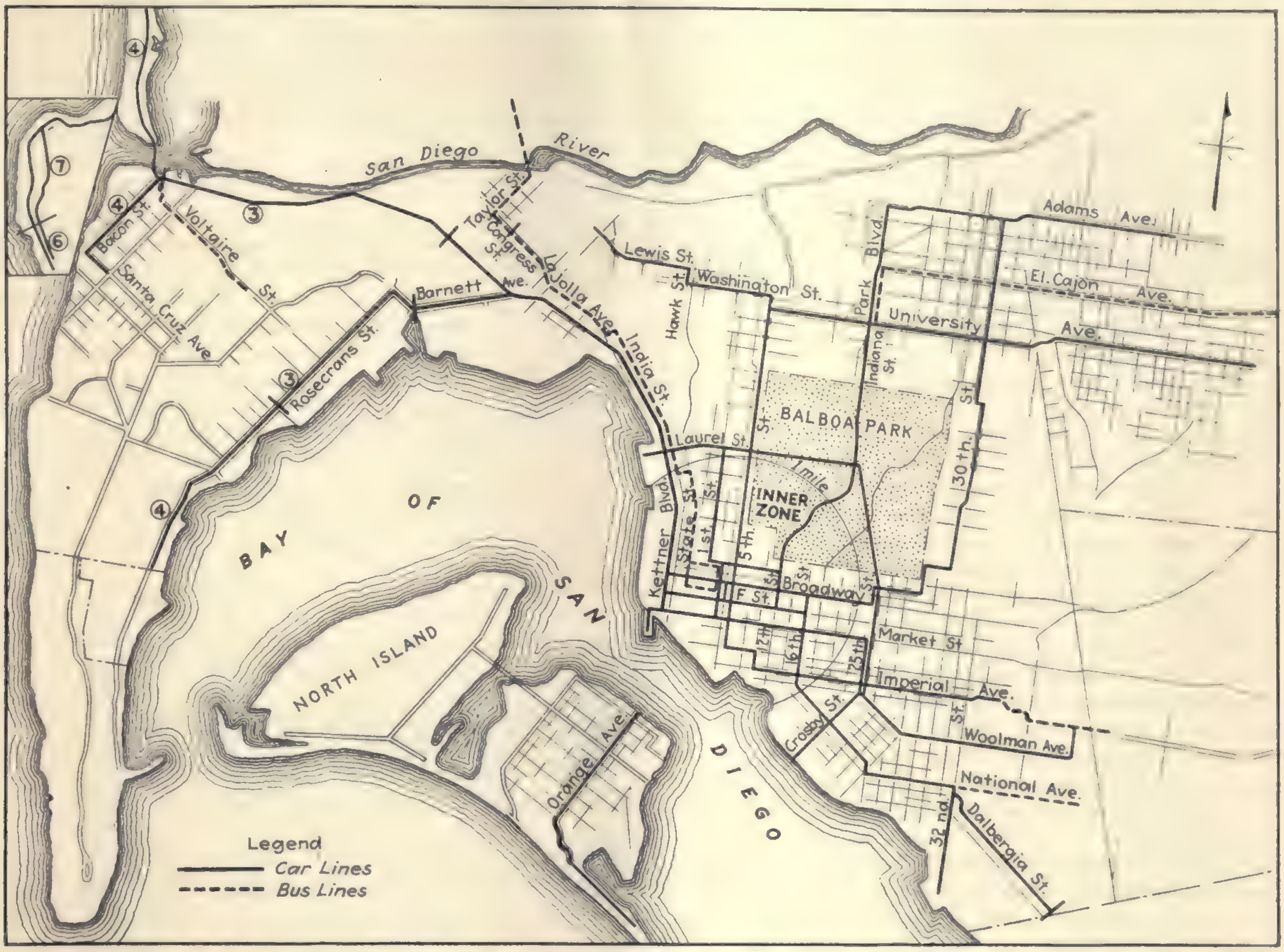
Zone System Builds Revenue in San Diego

City division includes two zones each with 5-cent fare. Commission of 3 per cent gross sales of tokens, passes and special forms of transportation paid to operators

SUCCESS of the zone system of fares and the weekly pass in San Diego, Cal., is attributable, according to the management of the San Diego Electric Railway, to the co-operation of the platform men in perfecting this somewhat complicated fare-collecting arrangement. An incentive, in the form of a commission or bonus paid each year to those of the operating staff who make an effort to sell the service of the company as indicated by the sale of additional passes and tokens, maintains the enthusiasm of the men for the system. The commission amounts to 3 per cent of the total sale of passes, tokens and special forms of transportation sold by the platform men. It is divided on the basis of total hours worked during the year by each man. This results in increased compensation to those who make the effort to sell the product of the company, namely, transportation. Such sales facilitate the problem of fare collection. For with passes, the zone system of fares is simplified, as the pass may be presented in lieu of a fare, thus reducing the work on the part of the trainmen. Similarly, with tokens, the work of the trainmen is materially lightened and the time required for the interchange of passengers is reduced as it minimizes the amount of change making.

In the main section of the city a 5-cent fare is collected from the short rider. The weekly pass of $1, however, entitles the passenger to ride in both zones of the city division

Two divisions are operated by the company, one the city division and the other the interurban division. The latter includes the suburban and intercity lines to La Jolla and National City. The city division, covering all city lines, is divided into two zones. The inner zone limit is just outside a circle with a 1-mile radius from Fifth and Broadway, the main downtown loading and diverting point. Hence the maximum ride in the inner zone is approximately 1.15 miles and the transfer ride from one side of the city to the other within the inner zone is approximately 2.25 miles. The outer zone extends from the inner zone limits to the ends of the various lines, a distance varying from 1.82 miles to 5.20 miles. Three heavy transfer points are located in the outer zone.



Map of the San Diego Electric Railway system showing the extent of the inner and outer zones

The inner zone is within a radius of approximately 1 mile from Fifth and Broadway, the heart of the business district. The outer zone extends from the limits of the inner zone to the ends of the city lines. The interurban systems are divided into 5-cent fare zones, the longest line—that which runs to La Jolla—having seven zones.

Fares on the city division are 5 cents cash in either zone and 10 cents cash for a single ride through both zones. Four metal tokens are sold for 30 cents, which makes the fare through two zones 7½ cents a ride. Weekly passes for both zones are $1. All city lines terminate downtown within the inner zone, as it would be impracticable for a line to operate from the outer zone, through the inner zone and out into the outer zone again, which would greatly complicate the handling of fares. Fares are collected once per trip, pay-as-you-enter inbound and pay-as-you-leave outbound. Because 80 per cent of the operation is with one-man cars, no attempt is made to identify or hat-check inbound passengers. However, the great majority of the travel is between homes in the outer zone and the downtown district. In addition 30 per cent of the number of fares are paid with the weekly pass. Outer zone riders are only a small percentage of the total. It is left to the operator to remember what 5-cent fares are collected in the outer zone and at the zone limit request additional fares. Hence, on inbound trips as passengers board the cars in the outer zone, they display a weekly pass, pay tokens, 10-cent cash fares, or 5-cent outer zone fares and are issued transfers, if requested. In the inner zone the passenger boarding displays his pass, pays 5 cents cash inner zone fare, 10 cents cash or token and, if the latter, is issued a transfer.

On outbound trips at downtown loading points all doors are opened. This practice facilitates the loading of passengers and a quick get-away. The fares are collected on the pay-as-you-leave plan, the operator handling a few at each stop, similar to the pick-ups on inbound trips. The passenger leaving the car in the inner zone pays 5 cents cash fare, inner zone transfer or displays a pass. Those riding into the outer zone pay the 10-cent fares or tokens or display passes. To the few who board the cars after leaving the inner zone an identification check is issued, which is returned to the operator with the outer zone fare as the passenger leaves the car.

Johnson fare boxes are used on all cars and for statistical purposes have attached to one side three small Veeder counters, one for recording the number of 10-cent fares deposited, another for recording weekly passes and another for recording school passes.

The interurban divisions are likewise divided into zones. On the National City line an additional zone to the two city zones is included. This line is covered by a $1.25 weekly pass or a 15-cent cash fare. On these cars an additional Veeder counter is mounted on the farebox for tallying the 15-cent cash fares deposited in the box. The records of 10-cent and 15-cent cash fares enable the auditing department to compute the number of passengers carried from the cash turned in. The Ocean Beach and Mission Beach interurban line has four zones, while the La Jolla line has seven. On these lines, however, the fare collection is handled on the pay-within plan. The fares are collected by various forms of car tickets, weekly passes, duplex tickets and with cash fare receipts.

Interurban weekly passes, of which there are several covering the four branches of the system, are sold by operators on cars of the respective lines. All passes, both city and interurban, are sold at the ticket office. As more than 90 per cent of the city passes are sold during the first inbound trip Monday morning operators are kept busy during the trip. The dollar sale of the pass, however, is made with no more trouble than collecting a cash fare, and the necessity for further change, transfer and identification checks is eliminated for the whole week. The only additional work consists of recording the pass rides on the Veeder counter when the pass is presented.

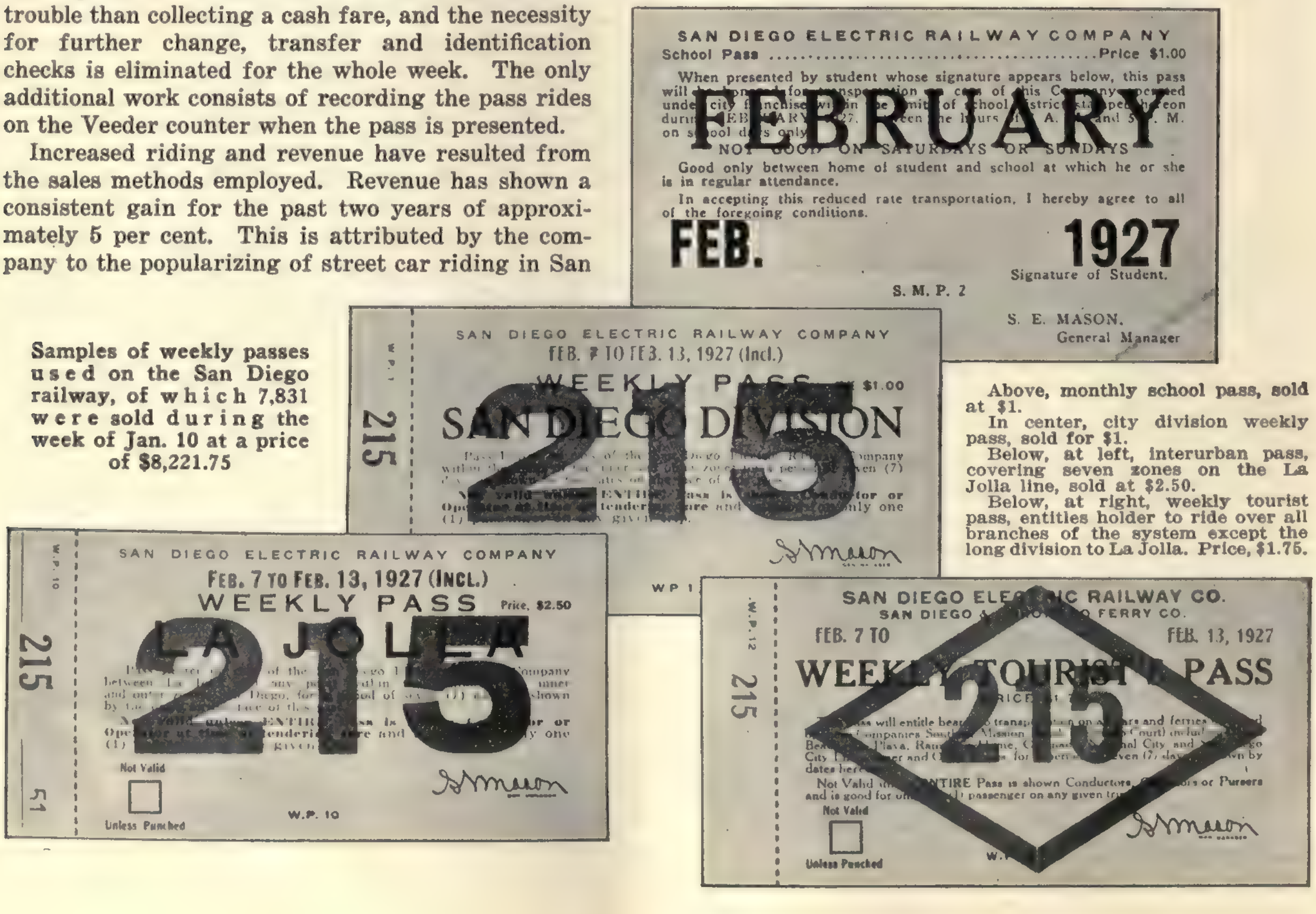
Increased riding and revenue have resulted from the sales methods employed. Revenue has shown a consistent gain for the past two years of approximately 5 per cent. This is attributed by the company to the popularizing of street car riding in San Diego by the zone fare system and the weekly pass. For the week of Jan. 10 to 16, which was an ordinary week, 7,831 passes were sold at $8,221.75, which provided 201,064 pass rides. While the pass revenue is not entirely satisfactory on account of the low rate per ride, it is kept in mind that passes are recorded each time they are presented, even though the passenger transfers twice during a single trip. Many of the pass rides are for a few blocks for convenience and the company is satisfied that the additional rides above the two peak rides each day are during the time when there is plenty of room to handle this additional patronage without additional expense.

Air-operated fare box used at San Diego

Use is made of the Johnson fare box for collecting all cash fares. However, to designate the 10-cent cash fares from the 5-cent cash fares a Veeder counter is mounted on the side of the box. Another counter is used for recording weekly passes and a third is used for recording school passes. Fare boxes on the interurban cars have additional counters for recording the various zone cash fares collected. This box is air operated.

As a result of the simplification of fare collection through the use of the weekly pass and tokens the company has been able to extend its one-man operation. Modifications have been made in the equipment to allow for this. The center-entrance type of car has been rebuilt to permit of one-man operation. End doors of the double folding type have been built in, the depressed center section raised and the side panels extended straight through at the point where the center doors were located. This work of modernizing the equipment has been going on in the shops of the company for approximately two years.

Almost all of the equipment is now



SAN DIEGO ELECTRIC RAILWAY COMPANY
School Pass ....Price $1.00

When presented by student whose signature appears below, this pass will [illegible] for transportation [illegible] cars of this Company operated under city franchise within the limits of school district stamped thereon during FEBRUARY 1927, between the hours of [illegible] A. M. and 5 P. M. on school days only.

NOT GOOD ON SATURDAYS OR SUNDAYS

Good only between home of student and school at which he or she is in regular attendance.

In accepting this reduced rate transportation, I hereby agree to all of the foregoing conditions.

FEBRUARY

FEB. 1927

Signature of Student.

S. M. P. 2

S. E. MASON,
General Manager

W.P. 1 215

SAN DIEGO ELECTRIC RAILWAY COMPANY
FEB. 7 TO FEB. 13, 1927 (Incl.)
WEEKLY PASS $1.00
SAN DIEGO DIVISION

Pass [illegible] of the San Diego [illegible] Company within [illegible] seven (7) [illegible] of [illegible]

Not valid [illegible] ENTIRE Pass is [illegible] Conductor or Operator at time of tendering fare and [illegible] only one (1) [illegible] given [illegible]

215

S.E.Mason

WP 1

W.P. 10 215 51

SAN DIEGO ELECTRIC RAILWAY COMPANY
FEB. 7 TO FEB. 13, 1927 (INCL.)
WEEKLY PASS Price, $2.50
LA JOLLA

[illegible] of the San Diego [illegible] Company between La [illegible] any [illegible] within [illegible] inner and outer [illegible] Diego, for period of seven (7) [illegible] shown by the [illegible] face of this [illegible]

Not valid unless ENTIRE Pass is [illegible] or Operator at time of tendering fare and [illegible] only one (1) [illegible] given [illegible]

215

Not Valid ☐ Unless Punched

S.E.Mason

W.P. 10

W.P. 12 215

SAN DIEGO ELECTRIC RAILWAY CO.
SAN DIEGO & [illegible] FERRY CO.
FEB. 7 TO FEB. 13, 1927
WEEKLY TOURIST PASS
PRICE [illegible]

This pass will entitle bearer to transportation on all cars and ferries [illegible] companies South of Mission [illegible] Court) including [illegible] Playa, Ramona, [illegible] National City and San Diego City [illegible] and [illegible] for period of seven (7) days [illegible] by dates hereon.

Not Valid unless ENTIRE Pass is shown Conductors, [illegible] or Pursers and is good for one (1) passenger on any given trip.

215

Not Valid ☐ Unless Punched

S.E.Mason

W.P.

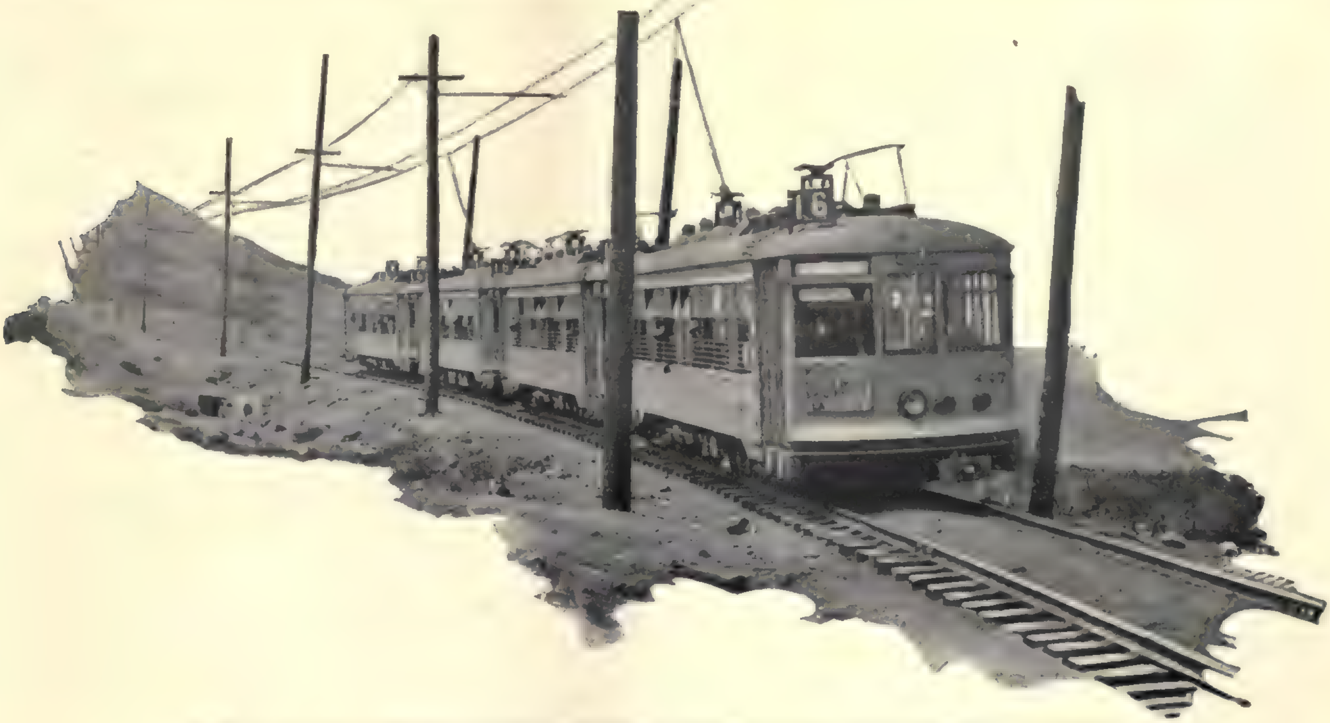
Samples of weekly passes used on the San Diego railway, of which 7,831 were sold during the week of Jan. 10 at a price of $8,221.75

Above, monthly school pass, sold at $1.

In center, city division weekly pass, sold for $1.

Below, at left, interurban pass, covering seven zones on the La Jolla line, sold at $2.50.

Below, at right, weekly tourist pass, entitles holder to ride over all branches of the system except the long division to La Jolla. Price, $1.75.



Where the Ocean Beach and La Jolla lines operate over the same track two-car trains are sometimes coupled together into four-car trains

Seven fare zones cover the longest of the interurban lines of the San Diego Electric Railway. Use is made of the automatic coupler for making and breaking up trains of the Ocean Beach and La Jolla lines at the junction of the two routes. On the interurban system the zone fare is collected within the car by the conductor. Two-car trains are operated to the junction point with three men. The forward car has the motorman and conductor, while the rear car has the combination motorman-conductor-operator. Beyond the junction the operator of the second car becomes the motorman and in addition collects the small number of fares in that short branch of the division. Sometimes four-car trains are operated.

changed over and the company is going ahead with the installation of leather-upholstered seats in the newer type of car. These improvements in the interior appointments, combined with an improved painting schedule, assisted materially in popularizing the street car ride.

On the Ocean Beach and Mission Beach-La Jolla interurban line the automatic coupler is used when the break in the train is made at the junction of the two lines. Its use has speeded up considerably this operation and has helped to meet the direct competition of one of the large established bus lines in the state. However, because of the modern type of equipment used and the speed and frequency of the service, the company feels that it is making gains even against well-operated bus competition.

New Traffic Regulations in Cincinnati

PEDESTRIANS have been given greater consideration in the new traffic regulations of Cincinnati, Ohio, effective May 6, according to Grover C. Smith, safety secretary of that city, who prepared a summary of this ordinance for the benefit of the public.

Section 680-5, in part, compels a motorist to stop when a pedestrian indicates his intention to board an approaching street car, provided the street car is within 100 ft. of the pedestrian. This rule applies where there is no safety zone.

In the section on speed limits, motor coaches are limited to a maximum speed of 25 m.p.h.

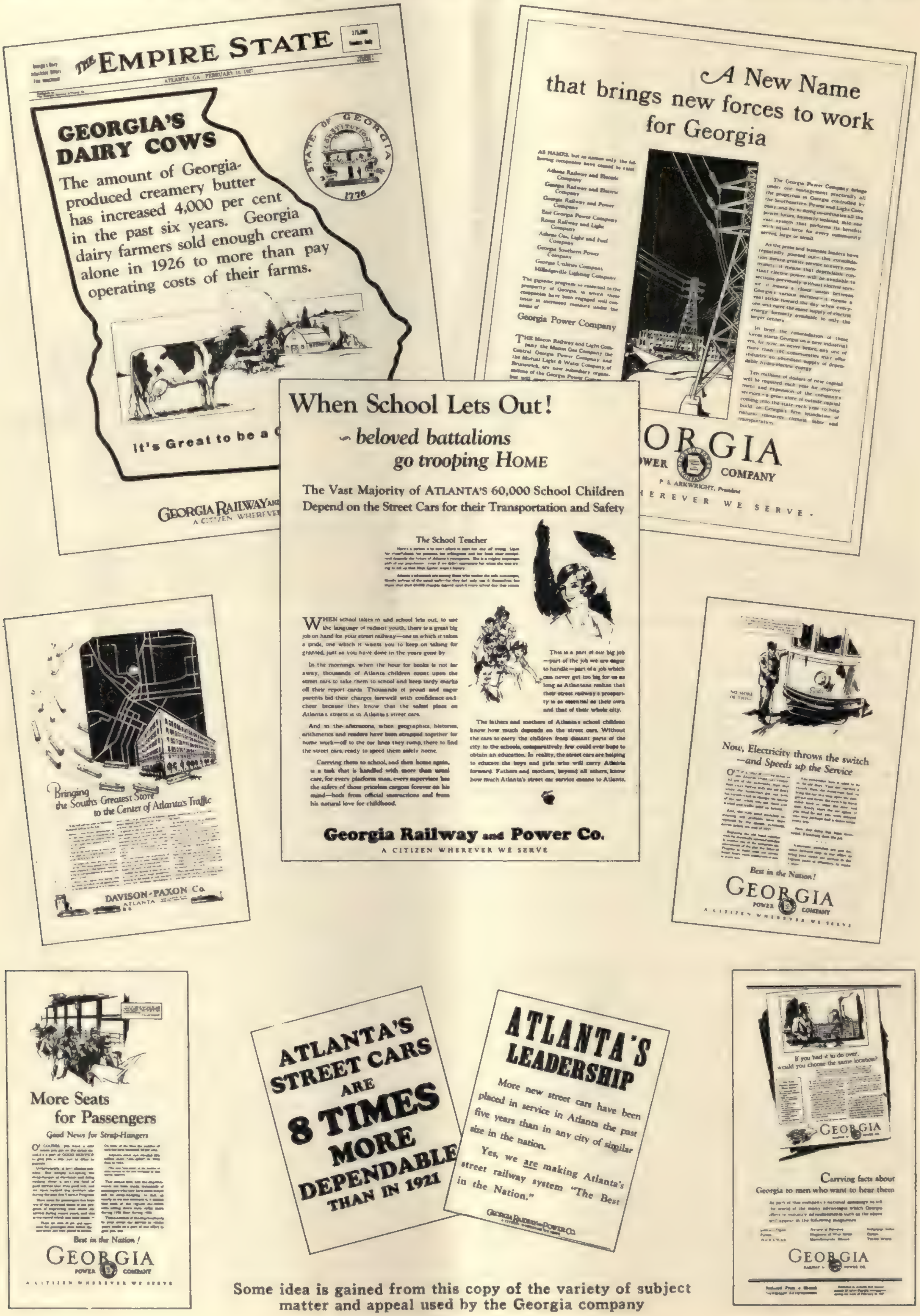
Steps were also taken to reduce congestion and traffic delays. Mr. Smith states on this score:

> One very serious problem in the past has been traffic obstruction and delay caused by backing trucks to the curb to unload. Under the 1927 ordinance this is prohibited in the congested district, excepting that coal trucks and building material trucks are permitted to back into the curb to unload between certain hours only. Outside the congested districts trucks may back to the curb at an angle not greater than 45 deg. The city manager is authorized to issue permits to back trucks to the curb in cases where it will be impossible to unload otherwise.

The ordinance has several new provisions for parking. The safety secretary announces that this ordinance is less restrictive on this point. In explaining this phase he says, in part: "The old ordinance prohibited all parking between the hours of 6:30–9:30 a.m. in the congested district. The new ordinance makes no blanket restrictions, but provides that police signs may forbid parking where the interests of the public require it. Under the present ordinance more than 50 per cent of the streets in the congested district will be open for parking between 7 and 9 a.m., whereas under the ordinance that was formerly in effect there was no parking at this time.

"It is the desire of the administration to provide as much curb parking space as possible. In order to do this the new ordinance prohibits the placing of unauthorized 'No Parking' signs or other traffic markers on any sidewalk or street. In this connection and in order to take care of the acute situation that has developed in the downtown section of the city the city manager is empowered to set aside loading space for any business house where he may deem the same to be necessary."

In regard to taxicabs, the most important change in the ordinance is that four taxicabs will be permitted to park anywhere in any city block not including those cabs that may be parked on authorized taxicab stand sites.



THE EMPIRE STATE

ATLANTA, GA. FEBRUARY 10, 1927

GEORGIA'S DAIRY COWS

The amount of Georgia-produced creamery butter has increased 4,000 per cent in the past six years. Georgia dairy farmers sold enough cream alone in 1926 to more than pay operating costs of their farms.

It's Great to be a G

GEORGIA RAILWAY AND

A CITIZEN WHEREVER

A New Name that brings new forces to work for Georgia

AS NAMES, but as names only, the following companies have ceased to exist:

Athens Railway and Electric Company
Georgia Railway and Electric Company
Georgia Railway and Power Company
East Georgia Power Company
Rome Railway and Light Company
Athens Gas, Light and Fuel Company
Georgia Southern Power Company
Georgia Utilities Company
Milledgeville Lighting Company

The gigantic program so essential to the prosperity of Georgia, in which these companies have been engaged, will continue in increased measure under the name of

Georgia Power Company

THE Macon Railway and Light Company, the Macon Gas Company, the Central Georgia Power Company and the Mutual Light & Water Company, of Brunswick, are now subsidiary organizations of the Georgia Power Company but will

The Georgia Power Company brings under one management practically all the properties in Georgia controlled by the Southeastern Power and Light Company and by so doing co-ordinates all the power forces, formerly isolated, into one vast system that performs its benefits with equal force for every community served, large or small.

As the press and business leaders have repeatedly pointed out—this consolidation means greater service to every community; it means that dependable constant electric power will be available to sections previously without electric service; it means a closer union between Georgia's various sections—it means a vast stride toward the day when everyone will have the same supply of electric energy formerly available to only the larger centers.

In brief, the consolidation of these forces starts Georgia on a new industrial era, for now as never before, any one of more than 160 communities may offer industry an abundant supply of dependable hydro-electric energy.

Ten millions of dollars of new capital will be required each year for improvement and expansion of the company's services—a great store of outside capital coming into the state each year to help build on Georgia's firm foundation of natural resources, climate, labor and transportation.

ORGIA
WER COMPANY
P. S. ARKWRIGHT, President
HEREVER WE SERVE.

When School Lets Out!

beloved battalions go trooping HOME

The Vast Majority of ATLANTA'S 60,000 School Children Depend on the Street Cars for their Transportation and Safety

The School Teacher

WHEN school takes in and school lets out, to use the language of radiant youth, there is a great big job on hand for your street railway—one in which it takes a pride, one which it wants you to keep on taking for granted, just as you have done in the years gone by.

In the mornings, when the hour for books is not far away, thousands of Atlanta children count upon the street cars to take them to school and keep tardy marks off their report cards. Thousands of proud and eager parents bid their charges farewell with confidence and cheer because they know that the safest place on Atlanta's streets is in Atlanta's street cars.

And in the afternoons, when geographies, histories, arithmetics and readers have been strapped together for home work—off to the car lines they romp, there to find the street cars, ready to speed them safely home.

Carrying them to school, and then home again, is a task that is handled with more than usual care, for every platform man, every supervisor has the safety of those priceless cargoes forever on his mind—both from official instructions and from his natural love for childhood.

This is a part of our big job—part of the job we are eager to handle—part of a job which can never get too big for us as long as Atlantans realize that their street railway's prosperity is as essential as their own and that of their whole city.

The fathers and mothers of Atlanta's school children know how much depends on the street cars. Without the cars to carry the children from distant parts of the city to the schools, comparatively few could ever hope to obtain an education. In reality, the street cars are helping to educate the boys and girls who will carry Atlanta forward. Fathers and mothers, beyond all others, know how much Atlanta's street car service means to Atlanta.

Georgia Railway and Power Co.

A CITIZEN WHEREVER WE SERVE

Bringing the South's Greatest Store to the Center of Atlanta's Traffic

DAVISON-PAXON Co.
ATLANTA

NO MORE OF THIS

Now, Electricity throws the switch—and Speeds up the Service

Best in the Nation!

GEORGIA
POWER COMPANY
A CITIZEN WHEREVER WE SERVE

More Seats for Passengers

Good News for Strap-Hangers

Best in the Nation!

GEORGIA
POWER COMPANY
A CITIZEN WHEREVER WE SERVE

ATLANTA'S STREET CARS ARE 8 TIMES MORE DEPENDABLE THAN IN 1921

ATLANTA'S LEADERSHIP

More new street cars have been placed in service in Atlanta the past five years than in any city of similar size in the nation.

Yes, we are making Atlanta's street railway system "The Best in the Nation."

GEORGIA RAILWAY AND POWER CO.

If you had it to do over, would you choose the same location?

GEORGIA

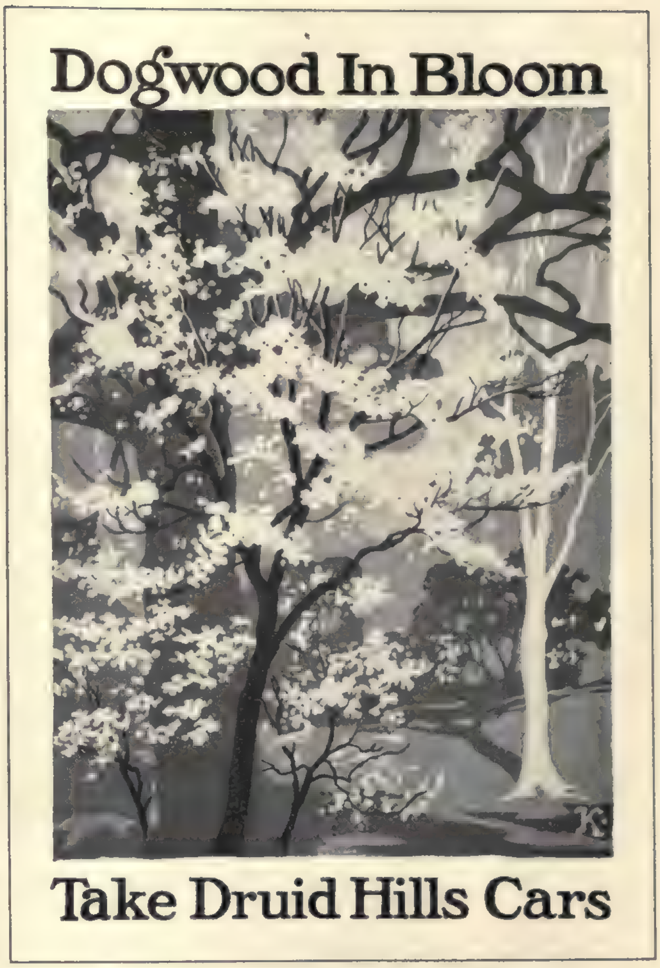
Carrying facts about Georgia to men who want to hear them

GEORGIA
RAILWAY & POWER CO.

Some idea is gained from this copy of the variety of subject matter and appeal used by the Georgia company

Car Publicity as They Write It in Georgia

Marching through Georgia with the pen instead of the sword, the Georgia Power Company is selling popular transportation from practical, emotional and social angles



Skillful use is made here of the esthetic appeal

YEARS ago a certain gentleman who said "War is Hell" got a lot of unfavorable publicity in Georgia by a campaign of destruction. History records that he had a pretty rough time traversing the state and that Atlanta didn't offer him any transportation facilities. But that was before the Georgia Railway & Power Company and its successor, the Georgia Power Company, started a publicity campaign. Doubtless were the gentleman to arrive today in the "Gate City of the South," with the same crowd behind him, he would order "stack arms" and make a rush for the nearest street car, completely defeated by the force of the pen as wielded by L. K. Starr, manager of public relations, and his corps.

Whether one is wrong or right in this assertion matters little when it is evidenced that thousands of Georgia's citizens are being sold on modern street car transportation because the Georgia Power Company is using in its publicity copy logical arguments and forcible illustrations to impress the public that it strives to be "A Citizen Wherever We Serve." This is no new move on the company's part, as readers of the JOURNAL will doubtless recall that from time to time progress of the publicity campaigns has been detailed in these pages, notably in Vol. 66, page 351, and Vol. 68, page 345.

As before evidenced, the company visualizes the transportation needs in terms of those everyday contingencies that confront the average citizen. Take, for example, the recent five-column advertisement, 14 in. deep, which appeared in the rotogravure section of the Atlanta *Journal* for March 6. "Smooth Going at Home!" it was headed, and then followed this text:

> The whole family, every day, gets comfort and convenience from the street car.
>
> The cook arrived on time, the children are safely off to school, the postman has brought the morning mail, everything running nicely, and the street car helped it along!

And then the text goes on to remind one of the part a street car plays in a trip to market, a visit to a friend, or to the park with the children or to the movies. All without parking worries, or in the latter event, the strain incident to driving in after-theater traffic. This advertisement was well balanced by sketches of father, mother and the children, and ample white space gave the reader the impression of dignity.

Turning from this homely appeal, one finds a subtle piece of copy directed at the "Men who never ride the street cars"; in other words, those citizens who roll up to their places of business in a limousine. This class of Georgian is not presented with an argument to forsake his means of transportation, but rather is reminded in a few pithy paragraphs that his business depends on the street car. For instance, one reads:

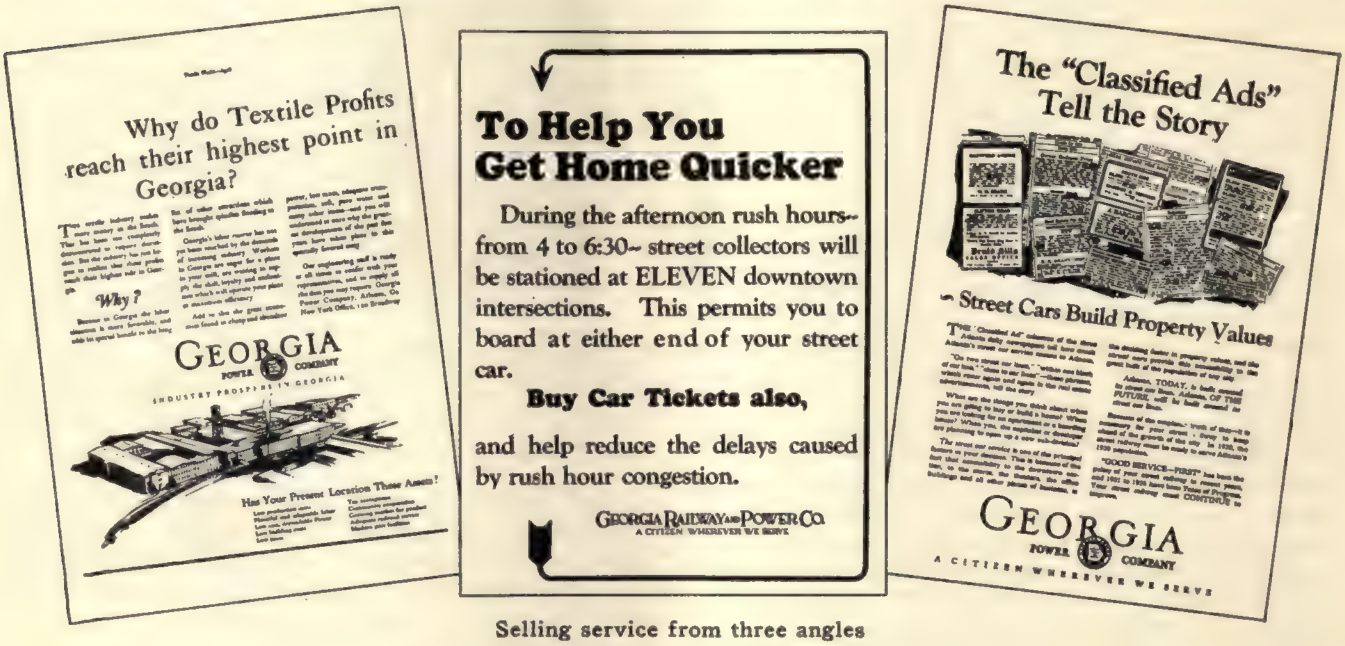
> You may be the head of a great manufacturing plant. Your limousine carries you there and calls for you at your convenience. But your workers depend on street car service without exception.
>
> You may never ride the street cars. You may drive to the office in your own car, day after day, the year round. But the people who keep your business going are street car riders.
>
> The banker knows that street car riders have built his bank.
>
> The capitalist also, and the real estate man—they know that property values are based on street car service.
>
> They (street cars) keep the cash registers ringing.

Here the responsibility for seeing that fair treatment is accorded the utility, carefully interwoven with an economic argument, is forcibly presented to the heads of big business.

In the March 12 issue of this paper W. H. McAloney, superintendent of equipment, told the field that in the last three years Atlanta has set the torch to 170 old cars and in their place are 196 new four-motor, low-floor cars. In a 60-in. advertisement appearing in the Atlanta *Journal*, *Constitution* and *Georgian* the traveling public was told something of the new cars in a way that appeals to the modern idea for speed. "Pick Up and Get Away" was the appeal slogan for this piece of copy and the Atlanta citizen was invited to imagine the street cars in terms usually associated with the operation of a high-class automobile. The following paragraph will suffice as an example of the text:

> A wealth of reserve power and speed is available—for the new street cars on city lines are capable of 30 miles an hour, while the palatial new interurban cars will run at 50! Of course, such speed is not needed or used, but isn't there a satisfaction in knowing what reserves of speed are in the powerful motors of your street cars?

Another forceful example of copy reveals that a new car talking point is developed also from the standpoint of miles per hour which have been gained in operation since 1923. One outstanding paragraph, it will be noted, contains a comparison of speed of Atlanta's cars with that of Chicago's. Another paragraph acknowledges the company's debt to the public by reason of the public's co-operation in eliminating car stops. Also to the efficiency of the company's employees. This copy, like all of the other samples on review, is characterized by extreme modesty in so far as the Georgia Power Company is concerned, which probably accounts for the fact that the Davidson Paxon Company, one of the largest department stores in Atlanta, in a full-page advertisement, used the street car service as a central theme when acquainting the public with the accessibility and convenient location of its new store at Peachtree and Ellis Streets.


Why do Textile Profits reach their highest point in Georgia?
Why?
GEORGIA POWER COMPANY
INDUSTRY PROSPERS IN GEORGIA
Has Your Present Location These Assets?

To Help You Get Home Quicker

During the afternoon rush hours—from 4 to 6:30—street collectors will be stationed at ELEVEN downtown intersections. This permits you to board at either end of your street car.

Buy Car Tickets also,

and help reduce the delays caused by rush hour congestion.

GEORGIA RAILWAY AND POWER CO.
A CITIZEN WHEREVER WE SERVE

The "Classified Ads" Tell the Story
Street Cars Build Property Values
GEORGIA POWER COMPANY
A CITIZEN WHEREVER WE SERVE

Selling service from three angles

As the reader may not be able to decipher some of the paragraphs of this ad appearing in the accompanying illustrations, two paragraphs are quoted to show what a vital element street car service was considered when these merchants decided on a new location:

> When you realize that during 1926 our street cars alone carried approximately 90,000,000 passengers, it is readily apparent that a large proportion of Atlanta's people depend upon the trolleys to get to and from the business districts.
>
> A glance at the map reveals the strategic position the new store occupies to the street railway system. Every line approaching the business center from all directions either passes in front of the store or near it. A few steps, at most, and you are on the threshold of our store.

"If the hill will not come to Mahomet, Mahomet will go to the hill." This was one of the italicized paragraphs of the ad, which strikingly illustrates how these merchants realized that they must locate where the street cars delivered the most passengers to the business district.

In glancing over other samples of the company's publicity copy one is particularly struck with the unique twist that is given to small and often forgotten equipment items and how these items are woven into powerful selling arguments. For instance, one piece of copy shows the motorman down on the ground in front of his car. He is holding an old switch stick. To the left of him are the words, "No more of this—," and below is this central theme:

> Now electricity throws the switch—and speeds up the service.
>
> Out of a total of 111 switches in the Atlanta street car system 102 are of the automatic type that does away forever with the delays when the motorman got out his switch stick to change the course of his car while you sat there and waited and traffic piled up behind.

Another advertising twist that is of great interest consists of giving the public a comparison of the power failures of 1922 with those of 1926. This argument backs up the central publicity message: "Dependable even in storms! Service when you need it." The text also contains a paragraph such as this:

> Out of the 365 days in 1926 there was 348 days on which there were no interruptions of this kind at all. Thanks to a complete modernization of our electric distribution system.

Pursuing the dependable theme, another advertisement, captioned "Around the World Without a Breakdown," explains to the layman what the term "Pull In" means, and then proceeds to give some telling figures as to how Atlanta stands with respect to "miles per pull in."

The text goes on to recount that the street railway companies have a "Southern League" of their own, and the 1926 totals on "miles per pull in" put Atlanta ahead of most of the other Southern cities in the league. Then a table is shown of Atlanta as compared with Little Rock, Memphis, Birmingham, Mobile, Dallas, Covington, Ky., Montgomery and Chattanooga.

Again driving home the dependability and service ideas large advertisements feature the tremendous responsibility that is placed on the street car company when the doors of the big stores close. From this theme one turns to the copy, reproduced elsewhere, which sells the street car on the basis of what it does in developing property.

In the realm of strictly industrial copy, one is attracted by an enormous advertisement captioned: "A New Name that Brings New Forces to Work for Georgia." Here a bold center illustration in black and white, showing a high-power transmission line, is flanked on either side by text describing the new combinations which made the Georgia Power Company successor to the Georgia Railway & Power Company. This copy was published in page form in practically every daily and weekly newspaper in Georgia.

In the field of national advertising the company has been most active. In this case, of course, Georgia is being sold on the basis of its hydro-electric developments. These ads have appeared in *Industrial Index, Furniture, Manufacture and Artisan, Industrial Management, Forbes, Cotton, Manufacturers' Record, American Woolen-Cotton Reporter, Finance, Printers' Ink, Magazine of Wall Street, Textile World* and *System,* and with the advent of the new year such magazines of general circulation as the *Literary Digest* and *World's Work* have been added to the company's advertising list.

While strenuous efforts have been exerted in national and local newspaper and periodical advertising, the company has not neglected its campaign of "window pasters," which for the most part are done in two-color inks on a background of white, yellow, green and orange paper. These pasters are in three sizes, 9½x18 in., 16x21 in. and 22½x27 in. In the smallest class such text matter as this has been used:

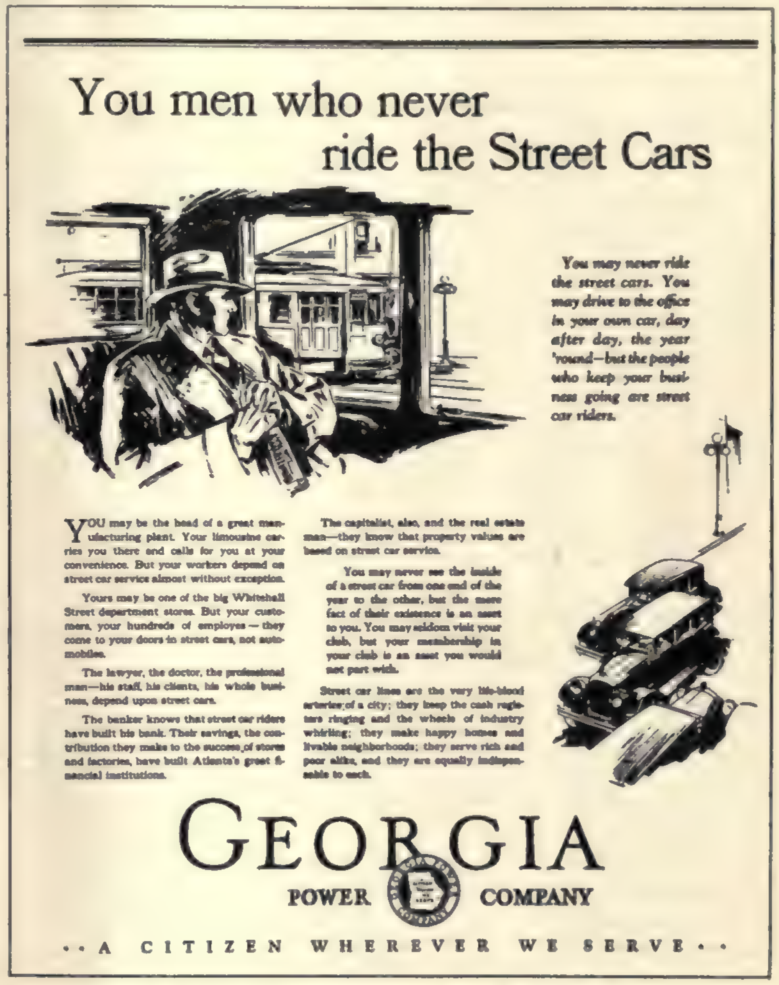
> For Atlanta's sake your street railway must be ready to serve the new population Atlanta will have in 1930. It's a good street car service now! It must be better in 1930. We believe that the only means of obtaining the friendly good will of the public is to deserve it. (This is signed by P. S. Arkwright, president of the company.)
>
> For your children's sake! Skating and playing in the streets not only are dangerous but are prohibited by law. Protect your children. Keep them out of the streets.
>
> Buy one dollar's worth of convenience—fifteen car tickets—a week's supply—for a dollar. Give it a trial.

On 16x21 pasters such appeals as these are made:

> Who pays for accidents? Can you afford weeks in a hospital? Your savings wiped out and probably heavy debts, perhaps the loss of your job? What of your family, your wife, your children? Can they afford to have you injured, perhaps permanently crippled? Think and practice safety.

As further proof that the Georgia Power Company thinks in other terms besides money and revenue, window pasters of the size 22½x27 carry such esthetic messages as this: "Dogwood in bloom. See it, but leave it for others to see." And from the commercial side, such captions as these: "Our goal, the best street car service in the nation." "More dependable! Power failures reduced—1922, 148; 1926, 17." And then the civic appeal, "Please don't throw paper on the streets. Help keep Atlanta's streets clean." "Your street railway must continue to improve."

And now to sum up briefly the publicity policy of the Georgia property one turns to the words of L. K. Starr: "Our street railway," he writes, "has made an unusually good record during the past five years. We have increased the speed of the cars, reduced power failures, increased the seating capacity and bought more new street cars than any other city of Atlanta's size in the nation. We are now telling the public of these improvements and future advertisements will tell about others.



You men who never ride the Street Cars

You may never ride the street cars. You may drive to the office in your own car, day after day, the year 'round—but the people who keep your business going are street car riders.

YOU may be the head of a great manufacturing plant. Your limousine carries you there and calls for you at your convenience. But your workers depend on street car service almost without exception.

Yours may be one of the big Whitehall Street department stores. But your customers, your hundreds of employes — they come to your doors in street cars, not automobiles.

The lawyer, the doctor, the professional man—his staff, his clients, his whole business, depend upon street cars.

The banker knows that street car riders have built his bank. Their savings, the contribution they make to the success of stores and factories, have built Atlanta's great financial institutions.

The capitalist, also, and the real estate man—they know that property values are based on street car service.

You may never see the inside of a street car from one end of the year to the other, but the mere fact of their existence is an asset to you. You may seldom visit your club, but your membership in your club is an asset you would not part with.

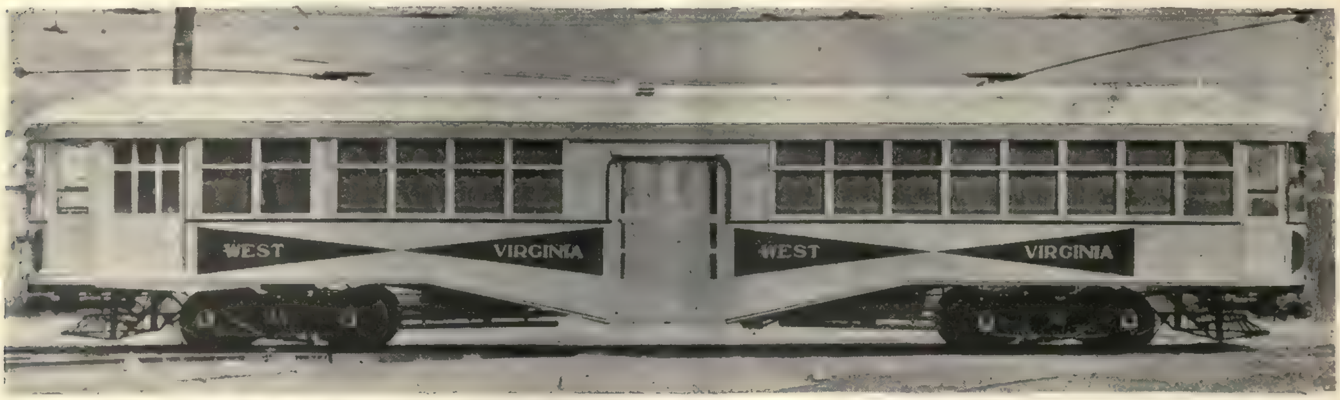
Street car lines are the very life-blood arteries of a city; they keep the cash registers ringing and the wheels of industry whirling; they make happy homes and livable neighborhoods; they serve rich and poor alike, and they are equally indispensable to each.

GEORGIA POWER COMPANY

· · A CITIZEN WHEREVER WE SERVE · ·

A direct bid for support from the capitalist

"You will notice the slogan 'Best in the Nation' is being used on each of these advertisements. This appeals to the pride of Atlanta people and apparently is having excellent effect. Recently we decided to test the effectiveness of these advertisements, and we asked our patrons to write us letters about the service. More than 200 letters were received in about ten days and, with the exception of two or three, all were warmly favorable to the company and its policy of 'Good service first.' This policy of the company is expressed in a quotation from one of Mr. Arkwright's speeches, 'A street railroad must have the good will of the public, but to get the good will it must deserve it. First of all it must render good service,' which is carried in a box in most of the advertisements. It is our intention from this point on in this series of advertisements to bring this idea of good service into greater prominence in the advertisements."



Painting of the car has been done with the colors of West Virginia University

Introducing the "West Virginia"

West Penn Railway Buys de Luxe Car Developed Especially for Fairmont-Clarksburg Limited Service—Comfort Features Attract Many New Patrons

IN OPERATION between Fairmont and Clarksburg, W. Va., is a new passenger interurban car which has recently been purchased by the Monongahela-West Penn Public Service Company. Known as the "West Virginia," in honor of West Virginia University, the body of the car has been painted in old gold and the name lettered in blue, these being the colors of the university.

Every description of up-to-date rolling stock which is being purchased these days of necessity places a great deal of emphasis on the various facilities which are provided to add to the comfort of the passenger. The "West Virginia" may differ in degree, but not in kind, from this general rule. Deep spring leather seats are provided, and there is a group of facing seats to accommodate passengers who wish to indulge in a game of cards or some similar pastime during the trip.

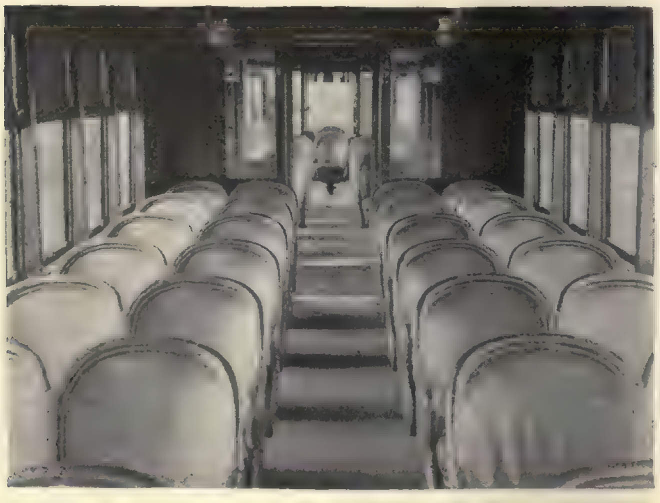
A SEAT FOR EVERY PASSENGER

Including the new single seats which are located in the center of the aisle near the rear vestibule, seats for 63 passengers are provided. The company has adopted a rule applying to this new car, which states that at no time will more passengers be accepted than may be provided with seats, so that crowding is impossible.

The car is of the double-truck, all-steel, center-entrance type and was built by the Cincinnati Car Company. Electrical equipment was provided by the Westinghouse Electric & Manufacturing Company, while the trucks were built in the shops of the West Penn Railways. This latter equipment was developed especially for operation over the Fairmont-Clarksburg run. The motors, of which four are provided, have a capacity of 65 hp. each.

The car is geared for a maximum speed of 45 to 47 m.p.h. It is 58 ft. in length and is divided into a regular passenger compartment, accommodating 35 passengers, and a smoking compartment, with seats for 28 passengers. Interior illumination is by 25 50-watt lights. The car is heated by 27 single coil, 400-watt heaters, which are thermostatically controlled. The cost complete for the car was $21,367; the body and underframe costing $10,972, the electrical equipment $5,725 and the trucks $1,921. Special seating equipment and interior fittings added $2,749 to the total cost.

The car makes only four stops between Fairmont and Clarksburg, the elimination of other stops and the higher operating speed of the car making possible a reduction of 25 minutes from the former running time between the two cities. Public patronage of the "West Virginia" has been increasingly heavy since it was first placed in service and there has been much favorable comment in the various communities served by the car concerning this effort of the West Penn Company to better its service.



Looking to the rear through the smoking compartment, showing the seats located in the aisle near the vestibule

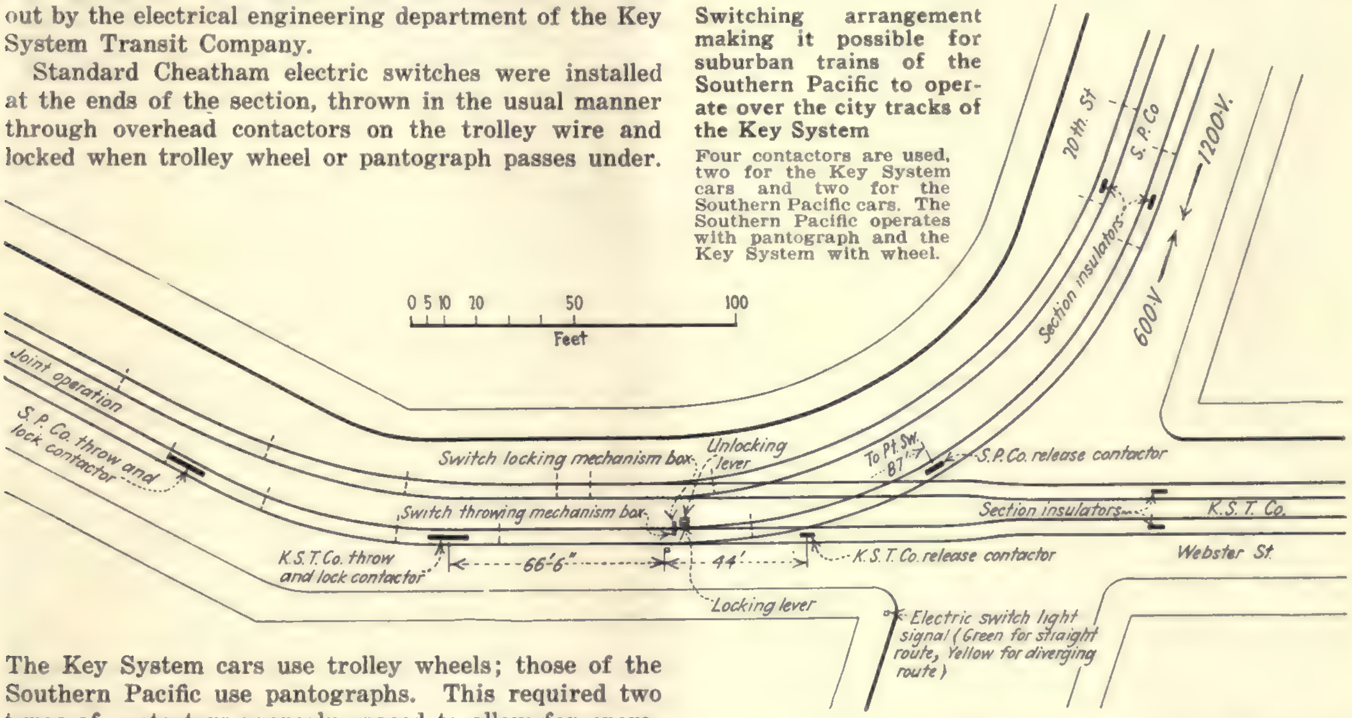
For the convenience of patrons who desire to indulge in a card game these facing seats were installed

Electric Track Switch Protection for Joint Operation

Key System Transit Company and Southern Pacific Railroad have novel system for protecting a short section of track in Oakland, Cal. Both pantograph and trolley wheel contactors are employed

JOINT operation by the Key System Transit Company's cars and the suburban cars of the Southern Pacific Railroad over a short section of the former's city track in Oakland, Cal., on Webster Street between Fourteenth and Twentieth Streets, required the installation of electric switches at each end of the joint track and in addition a locking device to guard against either company's cars splitting the switch. An ingenious arrangement for doing these two things was worked out by the electrical engineering department of the Key System Transit Company.

Standard Cheatham electric switches were installed at the ends of the section, thrown in the usual manner through overhead contactors on the trolley wire and locked when trolley wheel or pantograph passes under. The Key System cars use trolley wheels; those of the Southern Pacific use pantographs. This required two types of contactors properly spaced to allow for operation of both wheel and pantograph.


0 5 10 20 50 100
Feet
Joint operation
S.P. Co. throw and lock contactor
Switch locking mechanism box
Unlocking lever
To Pt. Sw. 87'
S.P. Co. release contactor
Section insulators
K.S.T. Co.
Switch throwing mechanism box
K.S.T. Co. throw and lock contactor
66'-6"
44'
K.S.T. Co. release contactor
Webster St.
Locking lever
Electric switch light signal (Green for straight route, Yellow for diverging route)
20th St
S.P. Co
1200 V.
600 V
Section insulators

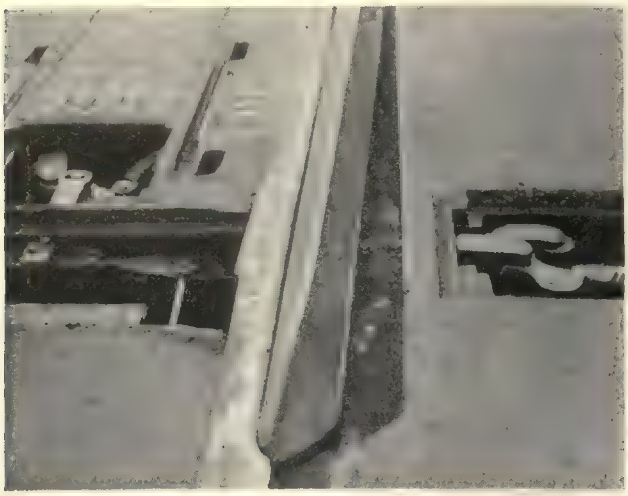
Switching arrangement making it possible for suburban trains of the Southern Pacific to operate over the city tracks of the Key System

Four contactors are used, two for the Key System cars and two for the Southern Pacific cars. The Southern Pacific operates with pantograph and the Key System with wheel.

Throw-and-lock contactors, one for wheel and the other for pantograph, are placed in advance of the switch a sufficient distance to allow for the throwing and locking of the switch before the front wheels of the forward truck reach the switch. Releasing contactors beyond the switch unlock it when trolley wheel or pantograph passes under them. The switch is also connected electrically with a signal having one green light and one yellow light. Green indicates that the switch has been properly lined up and locked so that the car may proceed over the straight track; yellow that the switch is set for the diverging route. After the car has passed the releasing contactor, thus unlocking the switch, neither green nor red light shows. Absence of a light in this signal as the car approaches the switch indicates that it is unlocked and that the motorman may proceed past the first contactor. However, after passing the contactor, if a light does not appear it indicates that the switch is not properly locked and that the car must be stopped before passing over the switch.

Should the switch fail to take the correct position or the signal fail to indicate the proper direction after the car passes the throw-and-lock contactor the crew must set the switch manually. For this purpose two hand throw levers are placed near the switch mechanism, one on each side of the locking device. One is to lock the switch, the other to unlock it. After the crew has determined if the tongue-way is free from obstruction the unlocking lever may be raised and the switch tongue thrown by a switch iron to the correct position. The unlocking lever is then lowered and the locking lever raised to lock the switch in this position. The car may then proceed after the crew has ascertained that it is locked, either automatically, as indicated by the signal light, or by hand.

Because of the two types of equipment it was unnecessary to instruct the motorman in throwing the switch, with power on for one way and power off for the other. When the pantograph passes its contactor the switch is automatically thrown in position and locked. Sim-



Switch tongue is thrown by mechanism located between rails. It is locked in position by mechanism located outside of track and parallel to the rail, as shown in the upper left hand corner

ilarly when the wheel passes its contactor the switch is thrown and locked in the other position.

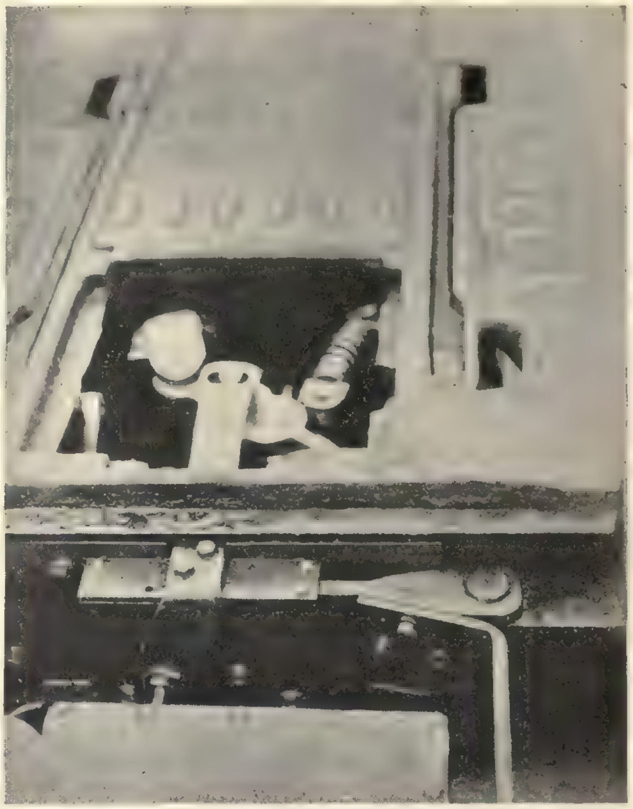
The contactor for the pantograph consists of a light framework of two runners approximately 10 ft. long, supported at the ends above the trolley wire and at two center points below the wire. One runner is broken at the middle, its ends being separated by an insulated joint. The continuous runner is positive, 600 volts, while the broken one is negative.

As the pantograph rides down on the runners of the contactor it first closes the circuit which throws the switch into the proper position and then closes the locking circuit.

RUNNERS DEPRESS PANTOGRAPH WHEN PASSING WHEEL CONTACTOR

The contactor for the trolley wheel is of the standard type. However, one side is split, so that the wheel first closes the switch-throwing circuit and then the locking circuit.

To protect the wheel contactors from the pantograph, runners are placed on the wire so that the pantograph is lowered. The wheel, of course, has no difficulty in passing through the pantograph contactor. Similar contactors are placed beyond the switch. However, in this case no protection is required for the wheel contactor which is on the track over which operate only the traction cars.



The locking mechanism is similar to the throwing mechanism. It thrusts a bolt through the extended end of the throwing arm. The signal changing box is in the immediate foreground. Rods from both the operating and locking mechanism close the proper switches to obtain the proper indication

Energy from the contactors is brought down to a standard electrically operated track switch. The first circuit closed throws the switch and also operates in a signal switch box one-half of a switch contactor. The second circuit closed by the pantograph or trolley wheel operates a similar switch-throwing mechanism placed parallel to the rail. This solenoid thrusts a bolt through the stem of the main switch-throwing arm. It also moves in the signal indicating box the other half of the contactor switch. The proper alignment of these signal-indicating switches lights either the yellow or green signal on the pole.

When the pantograph or wheel passes the release contactor the locking solenoid is energized, the bolt withdrawn from the control lever and the signal-indicating circuit opened.

Contactor for throwing and locking switch for Southern Pacific cars. One runner of this contactor is broken, allowing two separate circuits to be closed as the pantograph passes under the contactor

Contactor for trolley wheel is protected by runners which are placed on the wire to lower the passing pantographs and permit them to run by without closing the signal circuit

A green light in this signal indicates that switch has been properly lined up and locked for straight track. A yellow light indicates that switch is set and locked for diverging route

All of the operating mechanism is placed in the street and covered by heavy steel plates. However, the manual unlocking and locking levers are placed so as to be accessible to the train crew. In this installation it was necessary to specify the type of equipment to be operated over the switches and the number of cars in a train. Contactors for the Southern Pacific cars are located 151 ft. ahead of point of switch, requiring that the Southern Pacific train, if a single car (72 ft. 4½ in.), must have the pantograph on the rear end, while a two-car train must have the motor car on the forward end and the pantograph at the rear of this car. As the traction system operates only single cars with trolley pole at the rear these precautions were unnecessary.

Ohio Companies Increase Returns from Freight Hauling

THAT interurban electric railways are increasing their revenue from freight hauling is evidenced by the reports submitted by these companies to the Public Utilities Commission of Ohio for the past year. These reports show that the total freight revenue of these companies was $5,780,000, an increase over the year before of more than $1,000,000, according to the Ohio Committee on Public Utility Information. City, suburban and interurban electric railway companies last year carried 865,921,782 revenue passengers, which showed that the electric railway as a means of mass transportation in cities and means of travel between Ohio communities is exceedingly popular.

In order to improve their rolling stock and other equipment the electric railway companies of Ohio last year increased their investment by almost $42,000,000. These companies now have an investment of $357,955,000. Last year the electric railways of the state paid out $5,264,578 in taxes, and in addition $56,709,976 in operating expenses. The operating expenses increased over the year before by more than $2,250,000. The track mileage of these companies totaled 2,882.

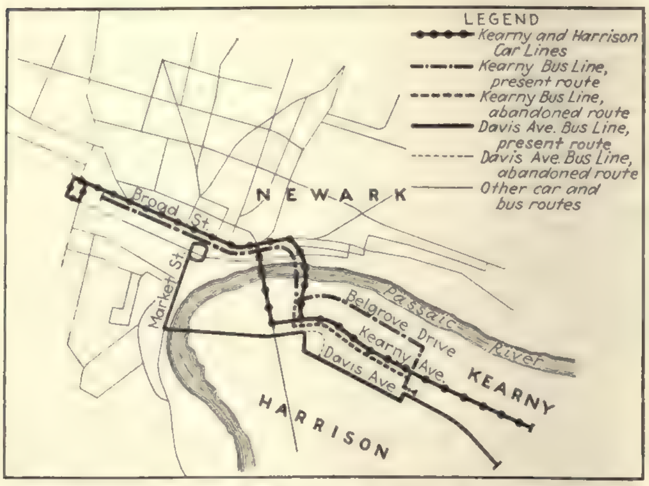
Revenue Increased by Co-ordination of Bus and Car Service

Route Changes Recently Made by Public Service Railway Have Eliminated Duplication in Harrison and Kearny—Transportation Is Furnished to Additional Territory

MARKED improvement in the local transportation facilities in the towns of Harrison, Kearny and Arlington, N. J., has resulted from a recent change in the routes of buses operated by the Public Service Railway. The territory within the boundaries of these three municipalities really constitutes one continuous residential community adjacent to the city of Newark, which lies across the Passaic River. Car service is given by two lines, Nos. 35 and 39 (Kearny and Harrison by name), which operate over the same track on Broad Street, Newark, and on Kearny and Midland Avenues, Kearny, diverging only for a short distance where they cross the river by different bridges. Two bus lines also serve the same general territory. The Kearny bus line, No. 36, formerly followed the route of the Kearny car line practically from end to end. The Davis Avenue bus line, No. 40, operates parallel to Kearny Avenue two blocks away to the east. An accompanying map shows the relative locations of these routes.

It was felt by the management that operation of cars and buses over the same route on Broad Street, Newark, and Kearny and Midland Avenues was an uneconomic duplication of service. After consultation with the local

New houses are being built along Belgrove Drive since the establishment of bus service


LEGEND
Kearny and Harrison Car Lines
Kearny Bus Line, present route
Kearny Bus Line, abandoned route
Davis Ave. Bus Line, present route
Davis Ave. Bus Line, abandoned route
Other car and bus routes
NEWARK
Broad St.
Market St.
Passaic River
Belgrove Drive
Kearny Ave.
Davis Ave.
KEARNY
HARRISON

Rerouting of Public Service bus lines in Kearny has eliminated duplication of service and provided transportation facilities in new territory

municipal officials it was decided to reroute the buses to Belgrove Drive, a street approximately parallel to Kearny Avenue, two blocks to the west. The headway was increased from five minutes to six minutes. This change was made on April 22, and on that date the Davis Avenue route was extended about ¾ mile and the headway shortened. As a result of these moves transportation facilities were given too much additional territory.

At the same time the company made substantial improvements in its car service in these towns. Formerly the Harrison line operated on a fifteen-minute headway all day, while the Kearny line operated only during rush hours. Removal of the buses from Kearny Avenue necessitated an increase in car service on that street. Each line now operates a twelve-minute headway all day, so scheduled as to give six-minute service everywhere except on the short section where the two lines follow different streets.

Cars of a semi-de luxe type have replaced those formerly used. Fifteen of the company's most recent city cars have been equipped with leather-upholstered, individual seats and linoleum floor covering. They have been painted a bright red to distinguish them from the other cars, which are yellow. In general the remodeling process was similar to that of cars on the Bloomfield line of Public Service Railway as told in ELECTRIC RAILWAY JOURNAL Jan. 22. Sufficient cars have been renovated to equip completely both the Harrison and Kearny lines.

The Kearny and Harrison lines of Public Service Railway have been completely re-equipped with semi-de luxe cars of this type

Since the new routing has been in effect, riding has decreased on the Kearny bus line, as was anticipated, and has increased on the two car lines and the Davis Avenue bus line. The net result has been a gain of about 2,400 passengers per week. This is expected to become more noticeable as the additional territory now being served for the first time builds up and produces more passengers. Already a score of new houses are being constructed along Belgrove Drive. This separation of car and bus lines to serve different districts instead of duplicating service in the same district is regarded by the company as an important step in the development of co-ordinated transportation.

Convenient First Aid Packet

ONE of the interesting exhibits at the joint session of the Southwestern Geographic Division of the National Electric Light Association and the Southwestern Public Service Association held in New Orleans April 26 to 29, inclusive, was a first aid packet recently adopted by the New Orleans Public Service, Inc. The packet is used on emergency trucks and its use will be extended to all electric cars of the company. The materials which are included and the arrangements of the packet were originated by one of the department heads of the railway.

Assortment of first aid material included in packet as used by the New Orleans Public Service, Inc. Instructions for use are included inside the cover

The various materials are included in a tin container which is absolutely dust and moisture proof. Particular attention has been given to the selection of materials so that they will provide everything necessary for first aid treatment of minor accidents and still not include any needless material or material which will be used infrequently. The packet contains two 2-in. bandages, one No. 2 tube of white vaseline, 1 yd. of plain gauze, one package of three swabs of mercurochrome, one yard of 1-in. adhesive plaster and a pair of surgeon's scissors. The total cost of the packet as furnished the railway is $1.16.

Arrangement of pipes for spraying buses

Keeping Cars Attractive at Small Cost

Frequent painting, use of spray methods where possible, efficient apparatus so that cars can be washed daily and a definite program to adopt improved devices have produced good results in Akron

By Pierre V. C. See

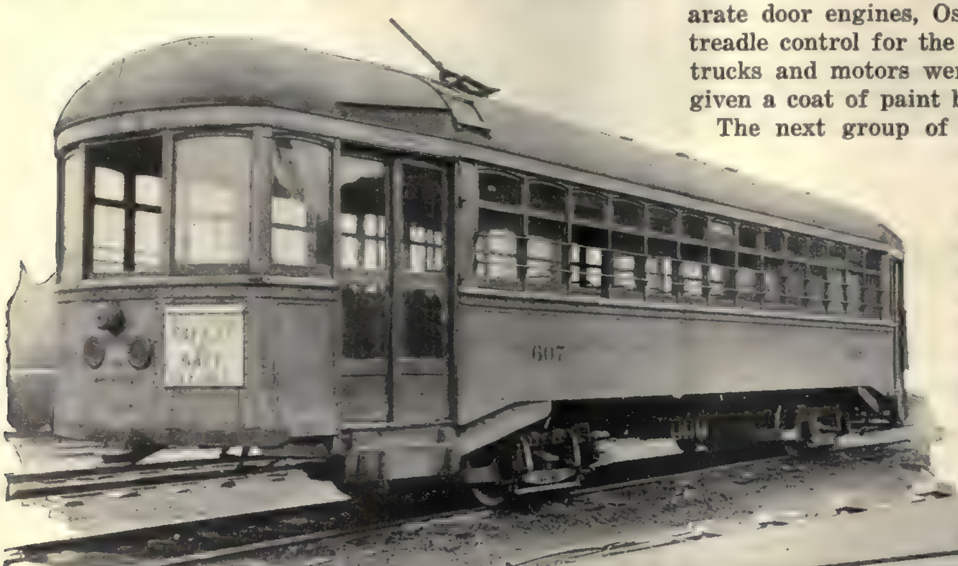
**Superintendent of Equipment Northern Ohio Power & Light Company
Akron, Ohio**

Passing a bus through the spray in its daily washing

MEN of any railway directly responsible for the maintenance of rolling stock are anxious to keep the equipment in the best possible shape and running smoothly. They realize that clean, well-painted cars are a necessity, but when the management finds it desirable to reduce the budget usually the first expenditures cut are those for painting and cleaning. The theory seems to be that a car will run just as well clean or dirty. However, in this the sales value of attractive rolling stock is not considered. This tendency to pare down expenditures for painting and cleaning results in the mechanical department having but a very limited amount of money to spend for this work. So in order that the entire equipment may appear at its best it is necessary to study the situation carefully and to do the work on each car as cheaply as possible so that all cars may be kept in about equal condition and in as good shape regarding painting and cleaning as the money will allow.

Paint does not get the close scrutiny on cars that it does on automobiles, pianos or house furniture. Cars are usually viewed by people from the sidewalks and small defects are not noticeable. Foremen painters should be taught that while they may wish to turn out a highly creditable, well-finished piece of work the management considers such an expenditure unwarranted. The foreman painter must be trained not to remove sound paint from a car being refinished just because it is chipped or broken in places. A coat must be applied over the old paint and no time should be wasted in puttying operations, glazing or sanding small spots and crevices. Of course all rust and scale must be removed and bare spots primed properly.

Spray methods of painting should be used as far as practicable. For frequent repainting of cars it is unnecessary to remove the sash if the spray is used only for the flat surfaces below the belt rail. In an economy campaign the painting of parts which necessitates the installation of guards or extreme precautions to keep paint from adjacent parts does not appear advisable. The practice of spray painting trucks frequently might also be questioned as the cleaning off of trucks and the spraying keep them looking fresh for but a few days. The use of transfer numbers, letters and monograms often results in a very considerable saving on the year's painting cost.



One of the double platform cars before remodeling

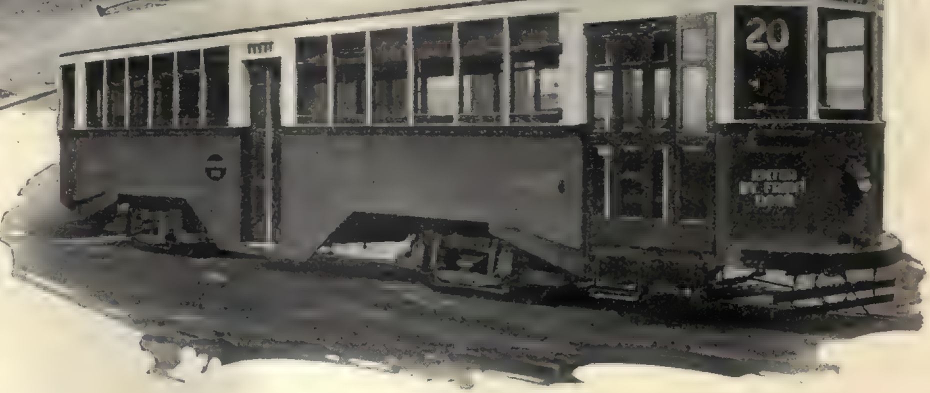
Where the allowance for car cleaning is limited and the number of cleaners has to be kept as low as possible, some efficient type of water spray system will be found of advantage. The usual method is to install this either at the entrance to a shop or at some point in the yard where the cars can be brought through the spray without undue switching. With an effective system two men can make a very creditable showing in the cleaning off of the outside and windows of cars with a very small expenditure.

An accompanying line drawing shows the car and bus washing system as laid out at the Kenmore shops of the Northern Ohio Power & Light Company. Two other illustrations show the equipment as installed. The practice at Akron is first to wet the car thoroughly by the spray and then to have one man on each side rub the parts with a brush. The car is then passed slowly through the spray a second time for rinsing.

Conforming with the present movement throughout the electric railway industry to provide more attractive rolling stock with greater comfort and conveniences, the Northern Ohio Power & Light Company during the past year started a campaign to get all of the equipment which it operates into as good condition as possible without undue expenditure of money. This campaign not only included the improvement of appearance and addition of comforts in cars, but also provided for economies and improvements in operation. It was planned to complete the work of car rehabilitation by March, 1927. Some of the improvements which have been incorporated are given.

At present 74 Peter Witt center-door cars are used for operation in the city of Akron. These cars are all of a steel, semi-lightweight modern type. In the remodeling program these cars were converted for one-man operation by the addition of safety appliances, separate door engines, Oskelite equipment and automatic treadle control for the center door. At the same time trucks and motors were overhauled and each car was given a coat of paint both inside and out.

The next group of cars on which remodeling was carried out included a series of 41 composite city cars with very large rear platforms. The cars are fifteen years old, but they are well built and in a good state of preservation. It was therefore felt advisable to rebuild them rather than to scrap them and purchase new equipment. For the sake of uniformity, it appeared most desirable to make them as nearly as possible like the Peter Witt cars so that there would be less confusion on the part of passengers where both types of cars were used. With this group of cars the front-entrance door was enlarged by moving the corner post forward and by taking away the panel between the door and car body so as to make a comfortable entrance. An emergency exit was provided and arranged for operation by a separate door engine. Full safety devices and all other appliances as used in the Peter Witt cars were installed. A center door was cut in the side of the car. As the floor of this type was higher than in the Peter Witt cars it was necessary to use three steps. All the steps were arranged to act as treadles for controlling the door. The long rear platform was cut off 3 ft. and was built up level with the rest of the car. A circular seat was then installed around the rear end. The rattan seats



Remodeled car provided with center door

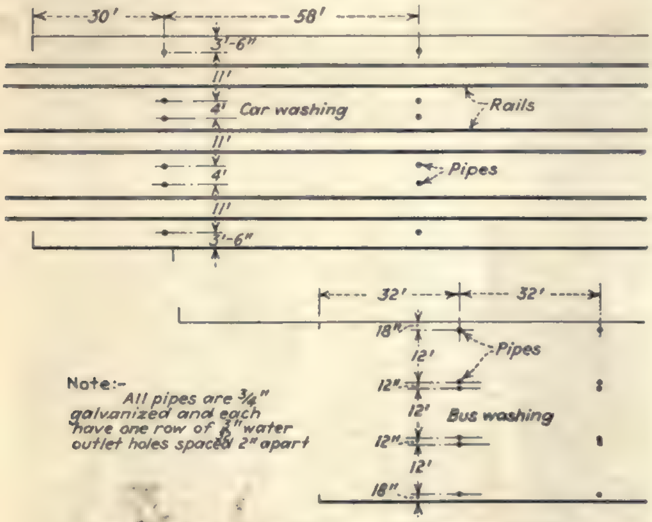
with which the car was equipped were padded thoroughly and covered with imitation leather. Inside and outside were painted carefully and the ceilings were given a high gloss white enamel.

While this body work was being done the trucks were overhauled, the gear ratio of the motors was reduced and helical gears were installed. In rehabilitating the motors the bearings were welded electrically and rebored. New housings and bearings were installed where necessary. With this change in equipment the car was provided with a faster pick-up and much quieter operation.

In Canton the Peter Witt cars have been equipped in the same way except that the treadles were not installed as the service was much lighter and treadles were not deemed necessary. Other cars used in the Canton service are of steel. These were converted for one-man operation by building up the rear platform and remodeling the front vestibule similar to the cars in Akron. Each car was painted during the process of alteration.

Interior arrangement of seats in chair car with linen covers

The interurban cars operated by the Northern Ohio Power & Light Company were given either a coat of varnish or a coat of color varnish and varnish, depending upon their condition. The interiors were freshened up with white enamel. As an experiment two cars were arranged for the installation of chairs. One of these was shown at the American Electric Railway Association convention in Cleveland last October. These chair cars have been running since the convention in regular service and very favorable comment has been received.



Arrangement of wash tracks at Kenmore shops

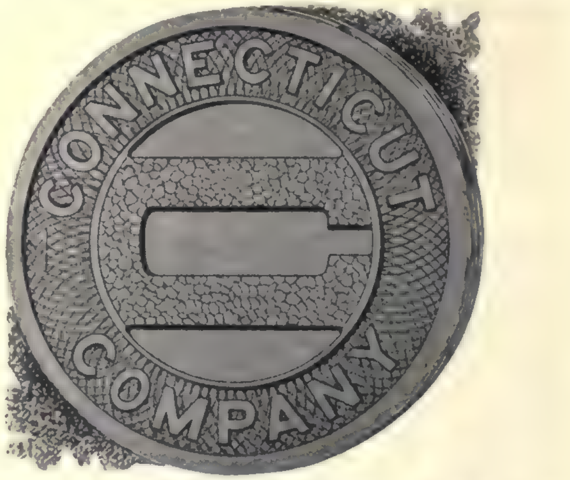
The campaign for better appearing cars has also been applied to the freight equipment operated by this company. Most of the freight cars have now been sprayed with paint so as to present an attractive appearance.

Clean and Beautiful Station Surroundings Win Awards

MINDALE and Union, stations on the northern division of the Illinois Traction System between Peoria and Springfield, Ill., have been awarded the grand prize for the best kept stations and grounds on the entire main division of this line. The grand prize was awarded to both because of the excellence of the conditions at both stations. The first prize of $35, the second of $25 and the grand prize of $65 were added together, and the total divided between these two stations. Third prize on the northern division goes to Danvers. On the central division, Harristown carried off first prize, on the eastern division Fithian, while on the southern division Gillespie was first. It was at the request of D. W. Snyder, Jr., vice-president of the Illinois Traction, that an inspection of the stations was made and recommendations for awards forwarded to him.

Where Connecticut Tokens Go

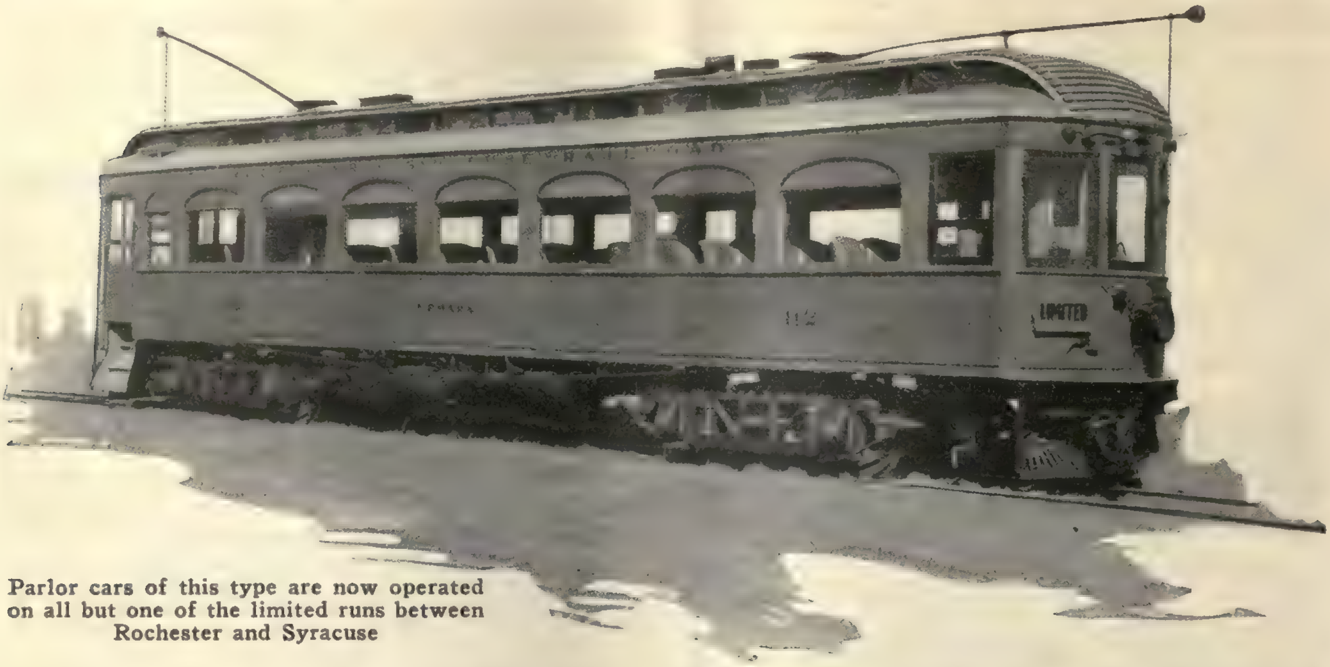
FACTS about the street railway are told in a booklet distributed by the Connecticut Company at the recent progress exposition held at New Haven. A historical sketch is given of the organization and development of the transportation system, and a statement of how the company's revenue is spent. To emphasize this the booklet has been made circular in shape, with covers that resemble a token, as shown in the accompanying illustration. Distribution of expenditures was shown as follows:



Booklet giving information concerning the Connecticut Company, made up to resemble a trolley token

Wages	$7,800,000
Supplies	1,500,000
Coal	600,000
Purchased power	600,000
Contract work	500.000
Accident claims	360,000
Taxes	490,000
Interest	400,000
Dividends	None

This booklet proved extremely interesting to the public, as indicated by the small number which were discarded.



Parlor cars of this type are now operated on all but one of the limited runs between Rochester and Syracuse

Rochester & Syracuse Cars Made More Attractive

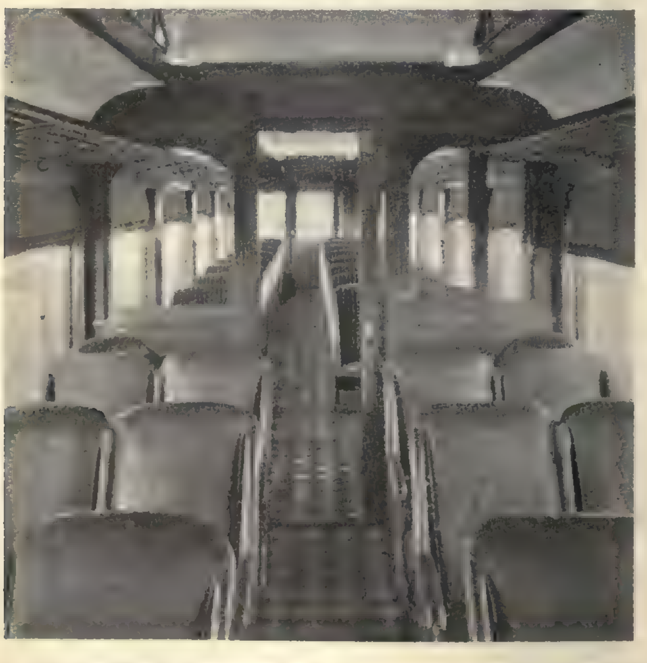
FIVE cars in limited service on the Rochester & Syracuse Railroad recently have been refitted with the object of making them more attractive to passengers and thereby encouraging riding. The car bodies are not new, but were completely rebuilt in 1923, and have been refinished. They are of the semi-steel type. Trucks have been thoroughly overhauled so as to improve greatly their riding qualities.

It is in the interior, however, that the greatest improvement has been made. In the main compartment the chairs are finished in leather and striped velour and are arranged in pairs on one side of the aisle with single chairs on the other. At the ends are other single chairs. In the smoking compartment the chairs are finished in leather and are arranged in pairs on each side with single chairs at one end. All chairs are deeply cushioned with heavily padded backs.

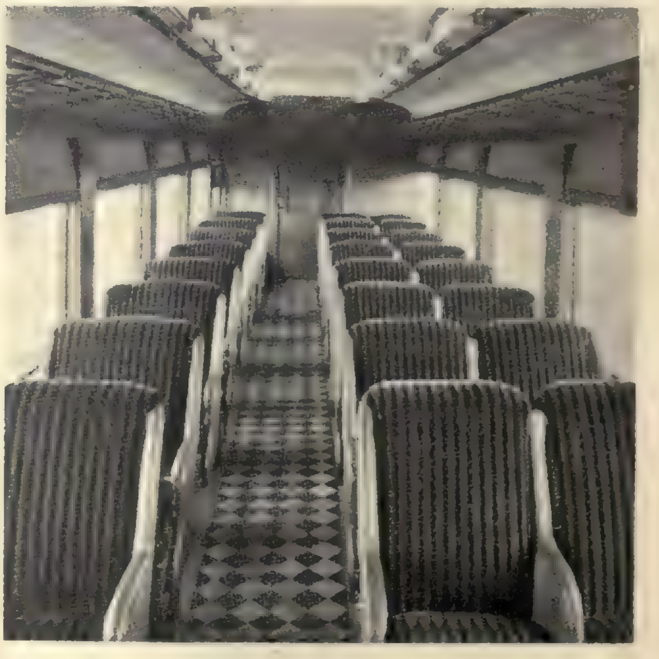
Five-foot plate glass windows materially improve the visibility and add to the attractive appearance of the car. The lighting system has been much improved by the installation of frosted bulbs and artistic shades. New baggage racks have been installed. The interior is finished in a soft dark gray color, harmonizing well with the gray leather and maroon gray striped velour chair covers.

The floorcovering is of rubber tile. This has had an important effect in reducing noise. Other noise has been eliminated by doing away with fare register apparatus, swinging bell cords, etc.

The first car was completed and put in service during the latter part of February.



In the smoking compartment the seats are upholstered in leather and are arranged in pairs on both sides of the aisle



In the main compartment seats upholstered in maroon and gray striped velour are arranged in pairs on one side of the aisle and singly on the opposite side

The walls of the blacksmith shop are sprayed periodically with white paint so as to give a clean appearance

Los Angeles Railway Shops Modernized

Machine tools have been changed over to individual motor drive and modern switching equipment has been installed. Particular attention has been given to provide a light, neat shop

AN EXCELLENT example of how an existing shop can be modernized is to be found at Los Angeles, Cal., where the railway company has in the last few years reconstructed its shops to a point where they compare favorably with plants built within the last few years. All machine tools, both in the machine shop, woodworking department and truck group, have been converted from belt drive to individual electric drive. The various departments have been spread out, for which purpose the shop buildings have been increased in size and new sections have been added.

All of this modernization of shop equipment has had its effect on the reduction of the cost per mile for maintaining the 750 cars of the system. As a result many improvements have been made in the rolling stock itself, since it is now possible to do this at a cost which makes it practical and economical.

The armature and electrical department of the Los Angeles Railway is clean and orderly with an abundance of air and light. In this department are handled armature rewinding, field coil rebuilding, dipping and baking of armatures and other phases of electrical maintenance.

The armature and electrical department of the Los Angeles Railway affords an example of cleanliness and orderliness

The blacksmith shop of a railway is usually the skeleton in the closet and as a rule does not lend itself to inspection by outsiders as an example of orderliness and cleanliness. The shop at the Los Angeles Railway, however, does not fall into this category. The walls have been sprayed with white paint and are kept clean by going over them periodically. The floor is swept clean, and the hand tools and materials are kept in order. Heavy steam hammers, bulldozers and cut-off machines are part of the mechanical equipment. Everything is available in the way of tools and machinery for complete construction of body and truck frames, and if necessary the company could build its own complete cars.

A portion of the machine tool room is fitted with lathes, drills and other pieces of equipment. This company has two porters on duty at all times washing the shop windows, which permits the large glazed areas to be utilized to full advantage.

Because of the large floor space available one room has been devoted entirely to drill presses and in this all of the drilling work for the system is performed. The arrangement of the individual motor-driven drills along the glazed side walls forms a striking feature. Fuse and switch boxes are installed on the walls, 440-volt, three-phase alternating-current power being used for all shop drives.

One room is devoted entirely to drill presses for this class of work

The machine tool room is provided with a large glazed wall, insuring ample light

Crossing Accidents in Milwaukee Reduced

NOTABLE success has been achieved by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., by reducing crossing accidents through the introduction and operation of flashing red light signals hung over intersections along electric railway lines, warning motorists that there is a street car crossing at that point. The warning lights were installed in 1925. Previous to their installation accidents in which street cars figured averaged 7.7 per month on 100 crossings. Today, with about 400 of these signal lights in use throughout the city, the accident curve at crossings has fallen off about 36 per cent, or about 4.9 accidents per month on 100 crossings. These beacons of safety, which flash a danger signal 30 times a minute, are one of the company's own creations. The equipment used for this purpose is produced in its shops.

$1,823 in Sick Benefits at Buffalo

APPROXIMATELY $1,823 was paid to members of the International Railway Co-operative Association, Buffalo, N. Y., in sick benefits in 1926. Two pension applications were also approved by the Co-operative Association, each member of which is insured for $1,000. About $13,000 was paid to families of members who died during the year. This information was contained in a report of George L. Burgain, retiring president of the Co-operative Association, showing that 99.68 per cent of all eligible employees were enrolled. The report also shows that employees of the company have an investment in bonds and stocks totaling $2,160,400 par value, plus $50,000 par value investment of the association. The co-operative saving fund now numbers 1,000 depositors, their deposits totaling about $100,000.

The association elected William E. Murphy, chief dispatcher and a director of the company, president of the employees' organization. Mr. Murphy had been vice-president and in September, 1926, was elected to the board of directors of the company. The vice-presidency of the employees' organization will be filled by H. P. Lesswing of the power and line department.

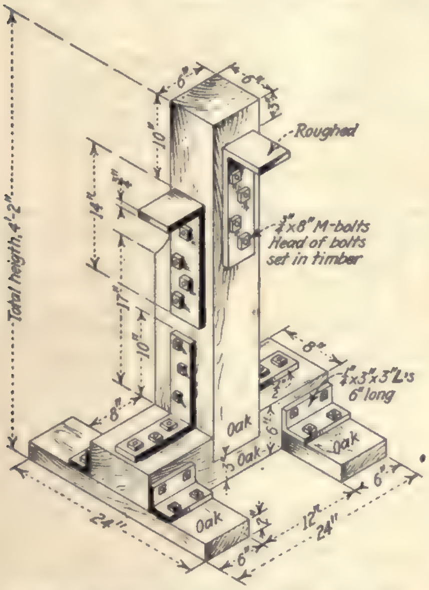
Capitalize Your Experience

See the Maintenance Competition announcement on page 1048.

Maintenance Notes

Convenient Support for Car Body

SATISFACTORY support for a car body while the trucks are removed and undergoing repairs is a problem that has been solved in the shops of the New Brunswick Power Company, St. John, N. B. With the old method of using steel drums with improvised cross-members such as track rails, timbers and blocking for supporting car bodies considerable inconvenience and difficulty were experienced. The steel supports on which the sills of the car rest are arranged at different heights on two sides of the upright, so as to provide for different conditions. The base is made of oak timbers 2 ft. long by 6 in. x 2 in. A cross-timber provides the support for the upright, which has a total height of 4 ft. 2 in. L-shaped steel braces reinforce all intersections. This type of support provides increased flexibility for height and is of particular convenience for workmen to work around. When not in use the stands can be stored in a very small space.



Car supports as used by the New Brunswick Power Company

Four of these are used for each car set. Their total weight is but 130 lb., which makes handling easy. The practice of the New Brunswick Power Company is to paint these supports a bright red, which gives them high visibility, and also suggests to the workmen that they should be used with care. The iron work is painted black.

Triple Baking Prolongs Armature Life

FAILURE of armatures and field coils on the cars of the Atlantic City & Shore Railroad, Atlantic City, N. J., have been greatly reduced in recent years since the adoption of dipping and baking. A feature of this process on which much stress is laid by J. W. Gordon, master mechanic, is that it is carried out three times. When a motor is overhauled, the armature and all field coils are removed and heated in oven to 170 deg., then dipped in Chinalac for 30 minutes. They are then baked at a temperature of 170 deg. F. for four hours. After that they are again submerged and baked for the same period. The process is repeated once again before they are replaced in the motor case.

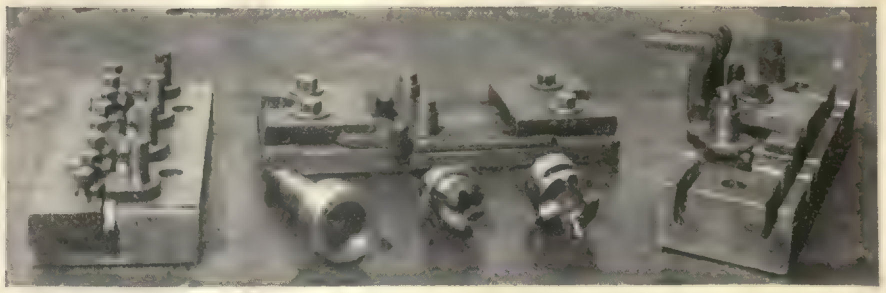
A Duplex Hollow Mill

FOR facing two shoulders and turning two bodies to different diameters at the same time a duplex hollow mill designed and constructed by the shop men is used in the 39th Street repair shops of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. It has a variety of uses, such as the machining of lugs on bell cranks and brackets used for the gates of elevated cars. The cranks and brackets are of unusual shape and are very troublesome to machine, if held in an ordinary lathe chuck. An accompanying illustration shows several

Finishing gate castings with duplex hollow mill of these gate brackets set up in a jig which holds them in position for machining, which is done with the hollow mill. In addition to facing off two shoulders of these castings, the upper portion has to be turned to a diameter of ¾ in. and the lower section to a diameter of 1 in. The tool has cutting surfaces so that all of these parts are finished in one operation.

The duplex hollow mill is thus four tools in one, two of which are used to finish the faces of the shoulders and the others to turn the round sections. The mill is made in three parts. One, shown at the left in the illustration, forms a holder for the two others and can be placed in a drill press in the same manner as a taper drill. The two other parts fit into the holder, one passing over the other. The center part slides onto the holder and is held from rotating by a key. The part at the right fits into the center part and has a keyway and set screw for fastening. The nut which may be seen on the center part regulates the distance with which the cutting edges are held apart. Means are also provided for longitudinal adjustment of the cutting edges so that grinding may not interfere with the desired setting of the tool.

It will be appreciated that with this kind of hollow mill, with the jigs shown, the time for doing the work is decreased enormously and also when the castings are machined an accurate fit is obtained and the various castings are uniform so that they are interchangeable.



The three parts of the mill are shown in the center, while jigs holding castings to be finished are shown at either side and in the background

A Winner

Announced Next Week

First	$200
Second	$100
Third	$ 50

Monthly Prize
$25

THE first monthly prize winner in the maintenance competition will be announced in next week's issue of ELECTRIC RAILWAY JOURNAL, dated June 18. The second installment of articles submitted in the contest will also appear. This competition is attracting widespread interest, and winners of the various prizes can feel proud of the distinction of having submitted a winning idea. All material received has been of a particularly high grade and the practices described are saving money for the railway properties which use them. The prominence given to such time and labor-saving methods or devices is sure to result in increased use and also to the development of similar practices which will prove of benefit to the systems on which they originate.

Many general managers have recognized the value to their men of these glimpses of successful practices that ELECTRIC RAILWAY JOURNAL is giving in its Maintenance Data Sheet section. They see that the descriptions get to the men who can profit most and so improve their own maintenance methods. They also see that they are filed properly so as to be available at all times and so constitute a Bible of Maintenance Methods. Heads of maintenance departments are also encouraging their men to submit ideas that can be sent in for the prizes.

One railway official wrote:

"I have interested all of our maintenance departments in this competition, with the understanding that any money received as payment for the articles or as prizes will go into a jackpot fund for an open-house inspection and celebration some time later."

Condensed Rules for the Contest

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 will be awarded each month. The first group of articles submitted was published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL for May 21, 1927.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

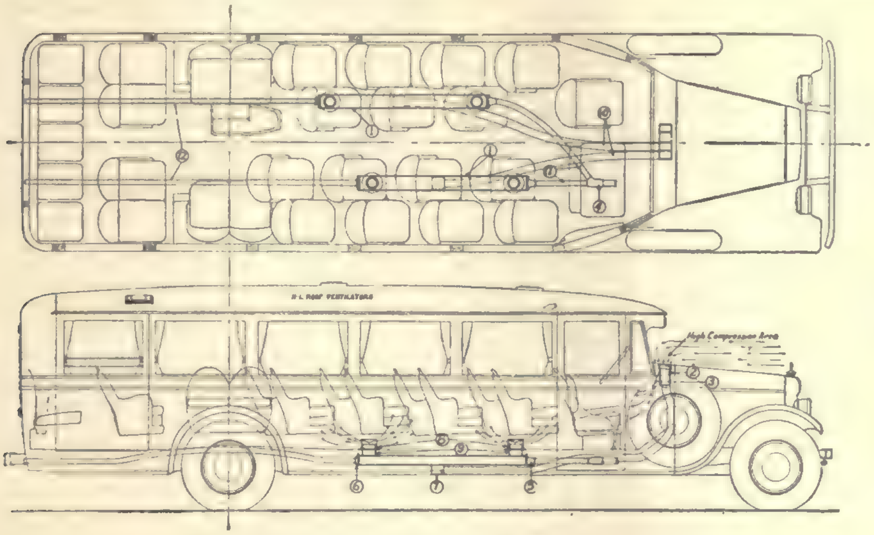
The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

New Equipment Available

Venti-Duct Heater

AMONG the advantages claimed for the N-L Venti-Duct heater recently placed on the market by the Nichols-Lintern Company, Cleveland, Ohio, are that a sufficient amount of heat is provided at zero temperature to make the coach comfortable at any speed; that increased ventilation is produced with even temperature throughout the coach; that fire hazards are eliminated; that obnoxious gases are avoided and the cleaning problem is reduced.



Circulation of air with new Venti-Duct heater

An all-weather cowl ventilator collects the air at high velocity and pressure at a point that insures against contamination from the engine. The force available gives a maximum heating effect. The highest degree of cooling of the cowl is provided as it operates regardless of weather conditions. This ventilator for the bus cowl was described in ELECTRIC RAILWAY JOURNAL for Dec. 4, 1926, page 1014.

Air passes to the heaters through a 3-in. flexible tube or its equivalent. It divides at this point and passes along the heater tubes in both directions. At each end of the heating chamber is an opening into the body having a diameter of 5½ in.

The exhaust line is split with a heavy cast Y and the exhaust is carried to the heater with a minimum of turns. As the heater is used as a muffler, exhaust heater valves and mufflers are eliminated. The outer casing of the heater is constructed of No. 20 gage cold-rolled steel. The exhaust passes through 1-in. seamless steel tubing brazed into heavy steel headers. The exhaust on passing through these tubes is cooled rapidly by the air passing over them and then passes out of the heaters to the rear of the coach.

Development in Two-Pole Switches

TWO-POLE switches with solid neutral block for use on three-wire grounded systems have just been developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., in sizes running from 30 to 600 amp. This design of switch provides an economic arrangement to utilize the advantages of reduced size made possible by using solid neutral without the third switch blade, the size being reduced to that of a standard two-wire switch.

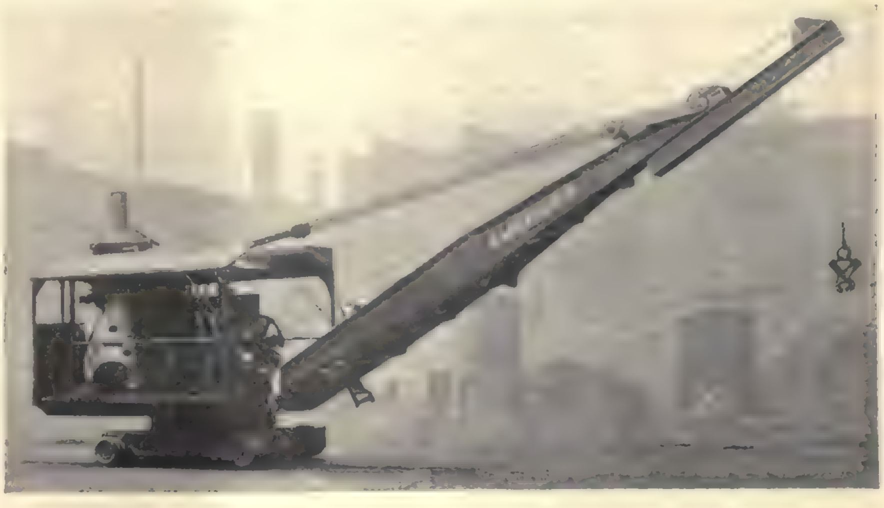
The 30-amp. size switch is of the "00" type, the 60, 100 and 200-amp. sizes of the WK-62 type and the 400 and 600-amp. sizes of the WK-60 type. All the types up to 200 amp. may be supplied with end or removable end adapted to a meter trip when it is desired to mount the meter in conjunction with the switch.

"Eventually, Why Not Now"
Use heat-treated bolts.

Boom Extension for Railway Ditching Machine

BECAUSE the railway ditching machine of the American Hoist & Derrick Company, St. Paul, Minn., is used extensively as a crane for handling rails and other materials, the makers have introduced a boom extension to facilitate handling of the 39-ft. rails now laid by a number of railways. This boom extension is composed of two 10-in., 20-lb. steel channels, 9 ft. long, braced with angles and channels. Beyond the main boom the 9-ft. channels are inclined together so as to give the proper clearance for the end sheave. After the dipper handle has been removed, the extension is bolted to the underside of the main boom, the attachment being arranged to provide for ready placing and removal.

This machine, whether used as a ditcher or crane, travels on a portable track on the floor of a flat car.



The boom extension facilitates handling of 39-ft. rails

Association News & Discussions

Winnipeg Welcomes Canadians

Enthusiastic Three-Day Meeting Held by C.E.R.A. Includes Many Operating and Maintenance Subjects

WINNIPEG, the capital of Manitoba and the midwestern metropolis of Canada, provided a right royal welcome for the Canadian Electric Railway Association last week. As guests of the Winnipeg Electric Company, the most representative body of operators assembled in the 23 years life of the association. Three morning sessions were held, on Tuesday, Wednesday and Thursday, May 31, June 1 and 2, followed by luncheons at which topics of interest to the members were presented. The afternoons were devoted to inspection of exhibits. On Tuesday and Wednesday evenings dinner dances were held at the Fort Garry Hotel. A total of nearly 200 members and guests were registered.

Tuesday morning's session was devoted to routine business and reports of committees. Four companies, the Newfoundland Light & Power Company, the Edmonton Radial Railway, the Saskatoon Municipal Railway and the Calgary Municipal Railway, were elected to membership, bringing the total up to 36 companies.

In his opening address President W. R. Robertson presented statistics showing the vastness of the empire and indicating the magnitude of the transportation problem. "In Canada today," he said, "we have more than 2,500 miles of electric railway, more than 40,000 miles of steam railway, 470 miles of canals and more than 210,000 miles of highways. Of the highways 25,265 miles are graded, more than 48,000 miles are gravel, more than 4,000 miles are macadam and more than 3,500 miles are paved. It is estimated that the investment in highways is in the neighborhood of $600,000,000 to $800,000,000.

"The investment in motor vehicles and horse-drawn vehicles is estimated in the neighborhood of $2,000,000,000, in steam railways $3,500,000,000 and in electric railways $221,769,000. The electric railways are carrying in the neighborhood of 725,000,000 passengers per year, or nearly double the number carried by all the other facilities. These figures show that in a country such as Canada, with its vast distances and its comparatively small population, there is a transportation problem faced by few other countries in the world today.

"The bus," said Mr. Robertson, "is having its field more clearly defined each year. While it is more apparent each day that up to the present time there is nothing which approaches the trolley car in over-all efficiency for the handling of mass transportation, the industry is waking up to the fact that the scope of its work is not confined alone to the operation of trolley cars, but also embraces many other fields of transportation, which formerly were either unserved or left to the haphazard control of small agencies.

"Notwithstanding that the ownership of motor cars in Canada has grown from 6,000 in 1910 to more than 820,000 in 1926, coincident with this growth electric railway revenue has increased from $17,000,000 to more than $50,000,000. Only two companies out of the 39 in Canada report a smaller revenue in 1926 than in 1925, although we have had to compete with jitneys, buses and trucks. There has been industrial depression and very small increase in population; in fact, many of the older sections show decreases. This situation justifies us in having the utmost faith in our industry."

Committees Present Reports

Discussion of committee reports showed the great interest being taken in many of the problems of today.

The report of the motor bus and truck committee, read by Mayor F. D. Burpee, Ottawa, in the absence of Chairman I. S. Fairty, stated that replies to questionnaires indicate that there have been few instances of actual discontinuance of bus routes, while on the other hand a substantial number of new routes have been established, and on the whole there is little bus competition with Canadian street railway lines. From 94 buses used by railway companies in 1925 the number increased to 202 last year. Many of the member companies have entered the local sightseeing business, with apparent financial advantage. This class of business coordinates well with other local services, giving employment to men and vehicles in off-peak hours.

"It is becoming more and more apparent," states the report, "that the operation of automotive vehicles by the transportation agency of any given area should not be confined strictly to the geographical boundaries of such area. For the street railway system to sit weakly by while others pre-empt all profitable interurban or suburban routes spells disaster in the long run. It involves a constantly increasing loss of local fares to such through-running buses, the creation of a network of outside franchises stifling and forbidding the normal growth and development of the local system, the occupancy by others of a field logically belonging to such system and necessary to the economical development of its urban services, and a substantial and pronounced loss of prestige and local favor."

A. H. Foster, Brantford, chairman of the committee on publicity and merchandising transportation, presented the report. This committee is preparing and disseminating information regarding electric railways along lines parallel with the American Association. Files are being built up by the secretary which will make available much valuable material hitherto unobtainable.

M. W. Wales, Winnipeg, read the report of the committee on rail corrugation for Chairman C. R. Kinnear. Tests are being made in conjunction with the corresponding committee of the American Electric Railway Engineering Association. In view of the lack of a solution the committee proposes remedial measures such as rail grinding. An abstract of the report will appear in a forthcoming issue.

Accident Prevention

W. R. McRae, Toronto, chairman, presented the report of the committee on safety and accident prevention. The apparent lack of interest in this subject was deplored.

A lively discussion followed. Mr. Robertson pointed out that the proportion of accidents increases with the car-miles operated, being most serious in the larger cities. Licensing of automobile drivers he feels is a means of reducing accidents. No person should be allowed to drive unless physically qualified.

That the one-man car has proved safer than the two-man car, due to the safety devices and undivided responsibility, was the evidence of the various speakers. Several roads have not yet had a single accident with the treadle door.

J. Metcalfe, Toronto, stated that the reduction in accidents on his system in the past six years has alone been sufficient to pay interest on the investment in safety car devices. In Toronto, he stated, every possible safety device is used. About 300 cars are run in the base hours and 900 in the rush. Of the latter total about 400 cars, including the trailers, are operated with one man. Treadle-operated one-man cars on this property number 150.

On this system it is not the practice to put a single safety car on a route to educate the public. A whole route is converted at once after preliminary advertising. A man rides the cars on the line and announces orally to the passengers the benefits of the new service.

It has been Mr. Metcalfe's experience that the treadle car with 80 to 90 passengers aboard will unload more quickly than any other type used in

America. No difficulty has been experienced when physically defective passengers alight.

C. H. Dahl, Winnipeg, stated that the boarding and alighting accidents on the treadle cars are far less than with other types operated in Winnipeg. An analysis has shown that 8 per cent of the trainmen are responsible for 25 per cent of the accidents. By eliminating some of these men the record has been much bettered.

D. E. Blair, Montreal, also stated that the treadle car is by far the safest of any type operated in that city. Treadle exits are used on 60 double-truck one-man cars and 100 trailers. Three or four slight accidents have been occasioned through the long flowing robes of nuns becoming caught, but there have been no injuries. In a few instances children have been caught when they were lifted off the treadle. No accidents have followed as the cars could not start.

R. M. Reade, Quebec, stated that accidents on one-man cars have virtually been eliminated. The accidents in Quebec average about one per 60,000 car-miles and the cost last year was 0.7 per cent of the gross revenue. The most dangerous accidents are collisions with automobiles turning out from the curb.

Mr. Robertson agreed with this last statement, based on his experience on the lines of the Ontario Hydro-Electric Power Commission. He also quoted figures based on results in the United States indicating that the one-man car is safer than the two-man car.

CAR MAINTENANCE RECEIVES ATTENTION

Wednesday's session opened with a lively discussion on car maintenance and noise reduction, led by Charles Comba, Calgary, and J. E. Watkins, Winnipeg. Mr. Watkins' paper will be published in a future issue.

Mr. Comba believes that spur gears are the greatest source of car noise. He insulates the gear cases by washers of leather webs.

Mr. Robertson states that he is obtaining an average of 100,000 miles from helical pinions. The gears probably will give 500,000 to 600,000 miles, although he has not as yet worn any out.

W. R. McRae, Toronto, agreed with Mr. Comba as to the noise of spur gears. He anticipates a life of 160,000 miles from helical pinions, although none have been removed. Major Burpee also is obtaining good results in Ottawa with helical gears.

J. F. Neild, Toronto, read a paper on the relative merits of various types of trolley wire. This is published elsewhere. With regard to life of wire, he stated that with a wheel pressure of 25 lb., No. 00 hard-drawn copper should be good for 3,000,000 wheel passes and tin bronze for 6,000,000 passes. Sag causes wear. In Toronto the practice is to stretch the wire as tightly as possible when it is strung in the coldest weather and let the sag come as it may in the summer.

E. V. Caton, Winnipeg, substantiated Mr. Neild's statements. The cadmium wire he has found to have a wear ratio of 1 to 1,654 in its favor as compared with hard-drawn copper.

A paper on economics in power distribution was prepared by A. J. Westman, Montreal. It was presented by A. S. Byrd in his absence. An abstract appears elsewhere. Manfred Freeman, Lethbridge, attested to the value of the mercury-arc rectifier, having the second one in Canada. Since it has been installed no trouble has been encountered, and the all-day efficiency has been increased from 50 per cent to 72 per cent. Mr. Byrd stated that the interference with telephones in Montreal has been eliminated and the telephone engineers are entirely satisfied with the use of the rectifier.

ENERGY-SAVING CAMPAIGNS SUCCESSFUL

D. W. Houston, Regina, told of a campaign which has been in force on his property in the past three years with the idea of saving one-fourth of the energy. As a result of intensive effort, the average cost during the past three years has been $118,348, as against $174,698 the year before the campaign was begun, a saving of 32 per cent.

Major Burpee stated that in Ottawa he has had good results with the younger men, while the older ones are hard to get in line. The record of each man in comparison with the average in his class is handed to him with the semi-monthly pay check. In several instances the records made have been so good that the lines have been speeded up, while at the same time accidents have been reduced as the cars are easier to stop.

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 13-16—**National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.**

June 15-16—**American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24—**American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

A bonus system was tried at first in Ottawa, but some of the men put energy saving ahead of service to the public. During the first year there was a saving of 10 per cent in energy with slightly increased car service. As a result of the campaign 10,000 car-hours have been saved by speeding up the lines.

FREIGHT HANDLING BRINGS EXTRA REVENUE

A paper on the benefits of freight handling was presented by T. H. Stoffel, Westinghouse Electric & Manufacturing Company. He pointed out that many opportunities exist for carrying light freight. By developing this business, which can be handled at low cost in addition to the passenger service, extra revenue can be obtained to offset losses in passenger service.

Mr. Robertson cited instances where the Hydro-Electric Railways have obtained extra revenue from freight and package haulage. Steam trains cannot handle this short-haul business economically, so that there is a considerable field for the electric line. On the other hand, trucks cannot move freight economically over 50 to 60 miles even at 100 per cent load.

W. H. Dinsmore, Vancouver, is using buses to pick up small parcels. He has also instituted a service with motorcycles. The business has now been developed to the point where it is the best paying department of the British Columbia Electric Railway.

DEVELOPING NEW SOURCES OF REVENUE

Much of Thursday's session was given over to the discussion of methods of increasing the miscellaneous revenues of a property, following a paper on this subject by W. H. Boyce, Pittsburgh, Pa. Mr. Boyce's paper is abstracted elsewhere. Mr. Robertson said in this connection that reductions in fare for certain specific conditions frequently bring in more revenue.

Mr. Dahl pointed out that the miscellaneous revenue is not a large proportion of the total. He feels that the high point in the Pittsburgh situation is the establishment of a commercial department. This is common practice with other utilities but rare with railways.

C. H. Clancy, Toronto, stated that a commercial department has been established by the Toronto Transportation Commission that is similar to the one described by Mr. Boyce. K. D. Miller, Toronto, feels that much can be accomplished in public relations by assuming that the passenger is always right.

Depreciation of motor buses was considered in a paper by D. E. Blair, Montreal, to appear in a future issue. W. A. Ernst, Grand River, also is of the opinion that a mileage basis for bus depreciation is to be preferred.

Mr. Dahl thinks operators have been too optimistic regarding bus depreciation. Eight years, he feels, is too great for present equipment. Five years, or a 200,000-mile basis, is to be preferred, and 300,000 miles probably represents a maximum performance. He also favors mileage as a basis of depreciation.

Zone fare systems for one-man cars were discussed in a paper by H. E. Weyman, Levis. Several speakers agreed that no perfect system has yet been devised for fare collection and that supervision is most essential.

John McNee, Vancouver, believes that there should be more co-ordination of the manufacturers in order to have an organization furnish cars complete. He feels that more attention should be given to regenerative braking, citing instances in England where it has been used advantageously. He is in favor of retiring obsolete equipment and believes that an investigation should be made of methods by which this may be done.

OFFICERS FOR THE ENSUING YEAR

Mayor Burpee, chairman of the nominating committee, presented the selections for next year's officers. The report was accepted and the officers elected unanimously, as follows:

Honorary president, A. W. McLimont, president and general manager Winnipeg Electric Company.

Honorary vice-president, Julian C. Smith, president Montreal Tramways.

Honorary advisory council: T. Ahearn, president Ottawa Electric Railway; Acton Burrows, president Acton Burrows, Ltd., and proprietor *Canadian Railway and Marine World;* Lt.-Col. J. E. Hutcheson, vice-president and general manager Montreal Tramways; George Kidd, president British Columbia Electric Railway; W. E. Phin, president Dominion Power & Transmission Company; A. E. Warren, vice-president Canadian National Electric Railways.

President, H. E. Weyman, manager Levis Tramways.

Vice-president, D. W. Harvey, general manager Toronto Transportation Commission.

Treasurer, H. C. Patten, comptroller Toronto Transportation Commission.

Auditor, J. E. Richards, manager and treasurer London & Port Stanley Railway.

Executive Committee: The president, the vice-president, the treasurer, the immediate past-president (W. R. Robertson, general superintendent Hydro-Electric Railways), and F. D. Burpee, vice-president and manager Ottawa Electric Railway; A. H. Foster, manager Brantford Municipal Railway; G. E. Waller, manager of railways Dominion Power & Transmission Company, Ltd.; L. Tait, manager and secretary-treasurer London Street Railway; D. E. Blair, general superintendent Montreal Tramways; W. S. Hart, vice-president Three Rivers Traction Company, and treasurer Quebec Light, Heat & Power Company; M. W. Kirkwood, general manager Grand River Railway; C. H. Dahl, assistant general manager Winnipeg Electric Company; D. W. Houston, superintendent Regina Municipal Railway; T. W. Brackenreid, manager Public Utilities Commission, city of Port Arthur.

Luncheon meetings were held on Tuesday and Wednesday at which important topics were considered. At the Tuesday luncheon addresses of welcome were given by Mayor Webb of Winnipeg and Mayor Swain of St. Boniface.

Labert St. Clair, advertising director of the American Electric Railway Association, was then introduced. He spoke on the need for co-operation and understanding between public officials and railway companies. Lack of it, he said, has caused a great deal of trouble.

At the Wednesday luncheon the speaker was C. W. Stocks, editor of *Bus Transportation.* He pointed out the need for a change in thinking by electric railway men, since the transportation business has become highly competitive. He outlined many ways in which electric railways can use buses to advantage without retiring the railway investment. An abstract of Mr. Stocks' talk will appear in a future issue.

Choice of Alloy Trolley Wires

BY J. F. NEILD

Electrical Engineer Toronto Transportation Commission

WE ARE invited to discuss the relative merits of phosphor-bronze, hard-drawn copper and cadmium trolley wires. At first thought it would seem that their relative merits are competitive. I am not so sure, however, that they are altogether competitive. Rather they represent the efforts of the manufacturers to solve the various problems confronting the railway operators.

Hard-drawn copper may be thought of as the base line, from which to make all comparisons of trolley wire, first, because the widest experience has been had with it; second, because it has been definitely standardized, and third, because it has the lowest cost per pound. Our wide experience has proved there are conditions to be met where hard-drawn copper will not fill the bill, and with these I will deal later. The standard has been established for tensile strength from 47,000 lb. per square inch for 300,000 circ.mil wire to 54,500 lb. per square inch for No. 1/0 wire, all having a conductivity of approximately 97 per cent.

PHYSICAL PROPERTIES OF BRONZES

Bronze trolley wire may be of phosphor bronze, silicon bronze or cadmium bronze. For the moment consider the first two, which are really tin bronzes, a mixture of from ½ per cent to 1½ per cent of tin mixed with copper and deoxidized with phosphorus or silicon. The phosphorus or silicon is introduced as a part of the process of making the bronze rather than a part of the mixture. A little phosphorus or a little silicon may remain, but it still would be phosphor bronze or silicon bronze if none of the agent remained in the mixture.

For electrical purposes a little phosphorus remaining would reduce the conductivity more than a little silicon would. The strength and general properties depend almost entirely on the proportion of tin and the treatment given the material; in other words, the amount of drawing after the last anneal or after the hot-rolling process. These bronze wires are being standardized. Their properties are given in the accompanying table.

Cadmium bronze is a mixture of cadmium and copper or cadmium, tin and copper deoxidized with phosphorus, silicon or similar agent. The use of cadmium in place of all or part of the tin reduces the conductivity less than all tin does, yet it gives strength, hardness and other comparable qualities. Cadmium in an alloy with copper is more difficult to control than tin. It is not practicable to go quite so far with cadmium as with tin in obtaining high strength. These controls, however, are all in practical operation and the increased conductivity combined with strength widens its field of use.

SELECTION OF WIRE DEPENDS ON THE SERVICE

In selecting these various trolley wires for most efficient use, the question of what kind of wear they will be subject to and the service required must be known. Relatively few people seem to realize that any contact wire is subject to two distinct kinds of wear: First, mechanical, and, second, what might be called electrical wear. Mechanical wear is the frictional wear caused by the passage of the collecting device along the wire, while the electrical wear is the effect of the sparking and arcing between collector and wire. For withstanding the mechanical wear undoubtedly the harder alloys stand up the best, and so on down the list until hard-drawn copper is reached, but for electrical wear the reverse is true, as hard-drawn copper will stand up under sparking and arcing as well as any of the alloys, and a great deal better than some of the hard ones.

PROPERTIES OF COPPER AND BRONZE TROLLEY WIRES

Material	Tensile Strength, Lb. per Square Inch	Conductivity Per Cent
Hard-drawn copper	47,000-54,500	97
High-strength wire, silicon bronze or phosphor bronze	66,000-76,000	40
Medium strength wire, silicon bronze or phosphor bronze	59,000-68,000	65
Cadmium-copper	54,000-58,000	92
Cadmium-tin-copper	60,000-69,000	65-80

This shows the importance of knowing all the facts when making a comparison of the wear on trolley wires, as in some circumstances the hard alloy wire will show up extremely well, while under other conditions the same wire will perhaps fail to make a satisfactory showing. It is also necessary to have the wires at the same tension, as the wear undoubtedly increases with the sag between suspension points.

Looking at the question from service conditions, it would appear to me that the following would be the guiding lines in choosing the kind of trolley wire, though not by any means hard and fast rules, as the final choice is a matter of engineering judgment of the service required balanced against cost. For light to moderate traffic on long tangent lines, where the trolley wires are utilized as part of the feeder system, hard-drawn copper or cadmium bronze would appear to be first choice. For heavier service, with some grades or easy curves and with reinforcing feeders, the 92 per cent and 80 per cent conductivity cadmium bronzes and the 65 per cent conductivity tin bronzes would share the field. For intensive service, sharp curves, etc., backed up by heavy feeders, the 40 per cent conductivity tin bronze would compete and probably hold its own over the other types.

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*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

Another point to consider is that the harder alloys will not stand up under excessive short-circuit currents as will the softer alloys. They do not anneal and draw out, but actually break up into beads. The high tin and the high cadmium-tin wires will do this, while hard-drawn copper is not subject to the action.

It would appear, then, that it is not so much a question of the relative merits of the various kinds of trolley wire, but the proper utilization of them. Let me remind you that obtaining the proper wire for the job is only half the battle, as it must be properly installed and maintained. Any wire will crystallize under repeated hammer blows caused by the trolley wheel at hard spots in the suspension or at bumps caused by wrongly designed or wrongly installed ears or fittings. Wires out of alignment are also subjected to excessive wear and tear by the side pressure of the wheel flanges. Worn trolley wheels also cause a great deal of damage to the trolley wire and no end of trouble from a maintenance standpoint.

One-Man Fare Collection on Suburban & Interurban Railways*

By H. E. Weyman
Manager Levis Tramways

IT IS ADVISABLE if not necessary that fares and fare collection on one-man cars and bus be simple and easy in order to lighten the duties of the operator and speed up schedules. Anything that tends to delay the speed and operation of a car is a sore spot with the traveling public, who have been trained by the automobile to expect quickness and dispatch. A minute to wait on a siding where suburban cars meet and pass seems an hour to the passenger. A lady who delays others from entering the car through having to hunt a large leather contraption full of miscellaneous articles causes a distinct change in the atmosphere of the car. Fare collection must therefore be such as to eliminate any delays or obstruction to car movements if the company is to retain its share of the transportation of the public and hold its own with the present-day competition of the private automobile.

The fact that there is no conductor necessitates a departure from old practices. The rate of fare has also an important bearing on the collection. The cash fare should be a simple coin per zone with possibly ticket rates to the constant rider. The copper rate of fare is unpopular and disliked by the public and a complication for the company. The nickel or dime is therefore the logical coin and the zones should correspond to the use of these coins—5-cent, 10-cent, 15-cent zones.

The methods of collection are diversified. Railways of practically the same characteristics often use totally different methods without regard to efficiency, public requirements and operating speeds because of belief or prejudices of the managements. I am, therefore, selecting a few methods which will appeal to the open-minded management. These are: The ordinary fare box system, the hat check system, the duplex ticket system, the differential register system and the ticket issuing machine system.

I think it is only right to mention that no fare collection system has yet been devised which cannot be beaten by the dishonest passenger or employee.

The Standard Fare Box System—As long as the railway zones do not exceed more than two the standard fare box with a register, if required, can be used, making the zones pay enter and pay leave. With a cash fare only, using a single coin fare unit, this is the quickest and simplest method of collection. Owing to certain local conditions some two-zone companies are not able to use the pay-enter and pay-leave. For instance, in order to flag two steam road crossings about a mile or more apart, and also to do police work at this point, on one system the flagman is the ticket collector and policeman for the second zone, traveling on the car until it meets the incoming car, which he boards and returns, making the collection while traveling.

A popular method for more than two zones with the standard fare box is to have the passenger pay on entering, receiving a check whose color and number shows the exact zone to which it is valid. The checks are returned to the operator when the passenger leaves. These checks are quickly identified because all the exit passengers in a given zone should have exactly the same colored checks. The limitations to this plan are that such a transaction with every rider must take up quite a lot of standing time and that there is no record of the distribution and classification of passengers.

The Hat Check System, so common with the steam roads, has been extensively used by electric roads. It requires two men per car and has so many loopholes that it has been more or less discarded and it is being replaced by the duplex system on the steam roads.

The Duplex System includes some type of open pad with a punch or cutter to make the same mark on the passenger's and auditor's portions and the form where the auditor's portion as notched remains in a locked box. On some roads the passenger's receipt, serving as a hat check or kept in sight by means of a clip, is taken up by the conductor; on others this is not done. Observation of the duplex system leads to the belief that it is not well suited for heavy traffic, particularly on one-man cars. The financial leak from the use of duplexes is the possibility of the conductor reissuing a used receipt. This does not require much finesse in the way of sleight-of-hand.

The Differential Fare Register System is another long outstanding system on which the operator makes a blind record of each fare collected according to classification. The passenger has a minimum of interest in the transaction, as he just wants to be sure that he will get the ride he paid for. The protection which the register gives the company depends upon the mathematical skill and memory of the operator. A clumsy thief will soon be caught by the discrepancies between register readings and turn in, while a skillful crook can do very well indeed.

The differential fare register not only shows the classification of fare paid but also shows between what stations or points the ride was taken. As the sheet also shows the on and off times of the operator, it becomes possible to work up a valuable record of the distribution of traffic between different points and during different hours.

One user of this style (Penn-Ohio Lines) gives out individual exit-zone receipts which are returned to the operator. The manufacturer has also brought out a ticket-printing attachment which gives a duplex to the passenger.

The Ticket-Issuing Machine has been recently developed, but is not yet used to any great extent. It has, I think, great possibilities and is well worth study and consideration. Such a machine will issue a printed receipt indicating the names or zones and the fare and date, etc. The operation is pay-enter and passenger pays the operator or puts the fare into the box and gets a ticket or receipt which he must hold and give up when leaving the car.

Under this plan, as outlined, well-nigh perfect check of revenue and riding is possible. The receipts turned in by the operator should balance the returns shown by his counting-type or locked box. From time to time also an analysis can be made of receipts on a given route, hour by hour, to observe the relative distribution of traffic throughout the day. On the whole, this machine ought to answer the purpose of zone-fare lines and opens a field of possibilities.

The Honor System of the Beaver Valley—The Beaver Valley Traction Company, operating near Pittsburgh, deserves special mention for having thrown the entire fare check system overboard with no apparent results to the bad. This property is divided into

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*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

5-cent zones and is operated exclusively with one-man cars. The main line has eight zones. A traffic survey showed that 65 per cent of the passengers rode but one zone and 25 per cent for two zones. This short-haul condition was of importance in deciding to give the no-check or honor system a trial. The plan was strongly advocated by the men as a means of speeding up the service and lightening their labors. It is worth mention that these men averaged a long term of service and had the confidence of the management. The change was made on March 30, 1924. Comparison of revenue before and after indicated to the satisfaction of the management that the honor system caused no loss. Such loss as did occur was definitely identified with industrial depression, for routes which had been operating without need of fare checks (one-zone and two-zone lines) showed still heavier losses.

Regardless of the type of fare collection used, one possible improvement can be applied generally, viz., the use of rate plans which will induce regular and semi-regular users of the service to pay for their transportation in advance. On the longer systems, mileage books sold at some discount have long been popular. Shorter lines with patrons taking twelve or more rides a week might well consider the use of the weekly pass provided the ride is not too long to bear repetition for social purposes. Also there are very few roads indeed that could not simplify their fare collection by selling round-trip tickets at a discount when bought in blocks. All these prepaid transportation plans will help toward getting more of the passengers' fares and getting them faster. The one-man car means a thorough overhauling of old ideas, since the fare collection problem is more pronounced.

Economics in Power Distribution*

BY A. J. WESTMAN
Electrical Engineer Montreal Tramways.

ECONOMIC layout of substations and a distribution system for city street car lines is generally a problem requiring the exercise of sound engineering judgment, past experience and a comparison of the various practicable arrangements from all points of view.

In the case of long, single roads, such as interurban or trunk lines, the design is more susceptible to mathematical treatment because the physical layout of the road and the traffic movement are relatively simple. Such is not the case for city street railway systems, where the whole question is complicated by the intricate layout of the tracks, by stringent traffic necessities, by the limitations in the voltage drop in the feeders and trolley wire and by the importance of lowering, to a reasonable value, the potential drop in the track so as to reduce to a minimum the possibilities of corrosion and subsequent damage to underground pipes, cables and metallic structures.

No hard and fast rules can be set for solving street railway networks, but, in our opinion, the "cut and try" method, using the car spot map, described in detail in the reports of the committee on automatic substations of the A.E.R.E.A. for the years 1922-1923, is the best. This method of study is certainly laborious, but we believe it to be more accurate than analytical methods. Such a method was used by the Montreal Tramways some years ago in determining the most appropriate location of the Cote Street substation, rendered indispensable by the great increase of traffic in the congested business zone of the down-town district.

A car spot map was prepared which showed the average distribution and position of cars during the evening rush period; the average current taken by each car was indicated on this map and considered as a load in ordinary statics, so that by finding the center of gravity of all these current loads the most suitable location for the substation was ascertained. The Montreal Tramways has found the results obtained by this means so satisfactory that it is now the standard way in which any new feeder layout or substation is determined.

PRESSURE DROP DETERMINES LOCATION

As the number of cars is steadily increased on any system and cars run at closer intervals traffic stops become more frequent, thus necessitating a quicker acceleration in order to maintain the schedule speed. This means that the rate of energy consumption per car is greatly increased and, therefore, also the intensity of the electrical loading. It is obvious that the governing factor in feeder design will not be overheating, but pressure drop, and a point will be reached where it will be more economical and generally more satisfactory to increase the number of substations rather than increasing the capital investment in the layout of new feeders.

Increasing the number of substations will affect the governing economic factors as follows:

(a) The cost of buildings and real estate will increase more or less directly with number of substations.

(b) Substation equipment costs will increase, though not proportionately, with the increased number of stations; this increase will be quite appreciable in case of automatic equipment.

(c) Cost of attendance will go up with manually operated stations, and, on the contrary, will be considerably diminished when automatic equipment is used.

(d) Losses in substation machinery will increase slightly if the new stations are manually operated, but will decrease where they are automatic, due to higher load factor of the station and reduction of no-load losses.

(e) Cost of distribution copper and distribution losses will decrease as the number of stations is increased.

For comparison, these quantities must be reduced to a common basis by assuming a so-called "fixed charge" percentage and applying it to first costs. Now, if a curve be plotted representing the sum of annual fixed charges, annual cost of power losses and annual cost of maintenance, as a function of "number of substations," we will have the "total annual cost" graph. This curve will show a minimum because of some of the factors increasing, while others diminish, as the number of stations is altered; the minimum point will indicate the proper number of substations to install from an economic point of view.

This will of necessity require at least a tentative station location design, of equipment and feeder loss calculations for each group of stations considered, and the study can be made even more carefully by changing the size and number of units per station, for a given number of stations. Therefore, several plans will have to be worked out and it is evident that this will entail, particularly if the area is large, a great task both of a statistical as well as of a technical nature.

The design of the negative feeders and the exact calculation of the voltage drop in the track is considerably more complicated than that for the trolley wire and its feeders, on account of leakage current due to the rails not being insulated relatively to the ground.

The Montreal Tramways has developed an extensive and highly satisfactory system of insulated negative feeders in the heavy and medium traffic down-town districts; it is intended to extend it to all other districts, so that ultimately it will have a complete and efficient negative network within the urban area of Montreal and immediately adjacent districts. The general consensus of opinion is that increasing the number of substations is one of the best methods to reduce electrolytic corrosion of underground pipes and structures.

For the last few years the Montreal Tramways has been engaged in thoroughly redesigning its generation and distribution system. The first step taken was to determine the best location for substations. This was done by making up a spot map showing the location of cars during peak load. Arrangements were made to furnish every car conductor with a printed card on which he reported the number of his car and its exact location at 6:10 p.m. on the day selected and the direction in which car was moving; simultaneously a careful record was made of the load on individual trolley sections. With this information available, the cars were located on a map of the city, from which we determined the electrical centers of gravity of selected areas and of areas adjacent to available sources of supply; at the same time a definite policy of changes and extensions was formulated, as follows: (1) Distribute power to substations at 13,200 volts. (2) Interconnect all substations. (3) Reduce the size of trolley sections. (4) Limit total installed converter capacity in any substation to 8,000 kw. (5) Limit the maximum capacity of any converting unit in substations to 2,000 kw. (6) Reduce the number of manually operated converting stations and substitute automatic control. (7) Limit return current to any substation to 10,000 amp., except in emergency. (8) Redesign positive and negative feeder layout. (9) Systematically check rail bonding conditions. (10) Ring-bus all intersection work in track. (11) Install a telephone system between stations and supervise operation by means of a load dispatcher.

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*Abstract of a paper before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

Obviously to carry out this policy some considerable time and expense were involved and the tramways has not yet completed all the work entailed, particularly in regard to reducing the number of manually operated substations, but much of it has been carried out.

A high-tension conduit system was constructed between the Hochelaga power house and the main substations. This conduit was liberally designed to permit of future developments, 4-in. round bore clay tile ducts being used. The copper cables installed in these ducts are all three-conductor, sector shape, No. 0000 A.W.G., paper insulated for a working pressure of 17,000 volts, the insulation thickness being ½ in. between conductors and ½ in. between conductors and lead sheath, the sheath being 9/64 in.

While this conduit work has been completed, further extensions of the system are in contemplation, the intent being to have ultimately a high-tension ring bus so as to make the delivery of power to converting stations as reliable as is reasonably and economically feasible.

Arrangements have been completed with the local power company for the delivery at two points of bulk power, in the form of three-phase, 60-cycle current at a pressure of 12,600 volts. In the east end of the city, at Hochelaga, which is one of these delivery points, the company has a thoroughly modern steam plant consisting of two 15,630-kva., 13,200-volt, three-phase, 60-cycle steam turbines and 4,000 kw. of engine-driven d.c. units, which are all available as a steam reserve in the event of any failure in the supply of purchased power.

IMPROVING THE RETURN CIRCUIT

Since 1918 all rail joints in paved streets have been electrically welded, while on suburban lines rail joints have been bonded by means of head or concealed copper bonds, either braised or welded to track. In Montreal all track intersection work has been completely ring-bussed with copper cable, the size of this cable being equivalent to rail capacity at important locations. The copper bus cables surrounding any special work are laid in small wooden troughs filled with pitch and carefully tied in with the intersection by means of auxiliary cables of 500,000 circ.mil with No. 0000 tail bonds. These ring buses are laid well clear of the intersections and bonded to tracks about 5 or 6 ft. from special work, in order to eliminate joint vibration and also to permit of special work being raised without interference to cables.

The Montreal Tramways has abandoned its former practice of laying an auxiliary copper cable between its tracks as a continuous bond, and the current flow in rails is now equalized by means of 500,000-circ.mil copper cross bonds, with No. 0000 tail bonds at each end, installed at intervals of about 500 ft.

The tramways distribution system in Montreal is divided into 22 trolley sections, with an average maximum of 39 cars in each section. Our present policy is to increase the number of trolley sections in order to decrease the number of cars per section. It is our practice to connect each trolley section to at least two stations.

As the number of our substations increases, and as we complete the duplication of high-tension power supply, the tendency will be to serve each trolley section from one station only, seeing that it is obviously more economical to duplicate power supply at high voltage between stations than to duplicate, or even triplicate, the supply from several stations to any particular trolley section at 600 volts.

The size of trolley wire used is No. 00 in city distribution and No. 0000 in suburban work, while the standard type of rail used is 115-lb. girder in city streets and 85-lb. "T" in open suburban work. In the underground or central district all positive and negative feeders are 1,500,000 circ.mil, the negative feeders having a potential wire in the same sheath, which is used for checking distribution of return current.

Rail taps from underground service to track are made with 1,000,000-circ.mil cable and feed in taps to trolley with 500,000-circ.mil cable, both rail and trolley service taps being furnished with suitably inclosed disconnecting switches in manholes. In aerial distribution work the standard sized feeder is 500,000 circ.mil with 250,000-circ.mil feed in taps to trolley.

Lightning arresters are used in all trolley feed in taps from underground service, as well as at points where aerial feeders connect. No arresters are used in general city service other than as above, but all suburban lines are fully protected.

The results we have obtained with synchronous converters have been most satisfactory as regards general operation, maintenance and efficiency, the efficiency of the 2,000-kw. units being over 94 per cent on full load.

A still more recent development, and one which has received our closest atatention, has been the introduction of the mercury-arc rectifier. The Montreal Tramways has recently constructed a substation at Verdun, using this type of equipment entirely. A full description of the installation is contained in ELECTRIC RAILWAY JOURNAL of April 30, 1927. The operating results obtained at Verdun to date have been highly gratifying, although the station has only been in operation about four months; however, we feel so certain that the mercury-arc rectifier has come to stay and has so many characteristics that are superior to other types of converting equipment that we now have plans in hand for the immediate erection of a second substation which will be equipped in a manner similar to the one at Verdun.

The automatic station has now been developed to a point where it can be considered as thoroughly reliable and in many respects superior to the manually operated station. It has, of course, some limitations which may be overcome to a large extent by partial or full "supervisory" control, but a careful perusal of the technical press will show that the use of automatic substations is growing in favor.

Development of Miscellaneous Revenue*

By W. H. BOYCE
Commercial Manager Pittsburgh Railways, Pittsburgh, Pa.

DURING the receivership of the Pittsburgh Railway, from 1918 to 1924, rates of fare were gradually increased from 5 cents until a ruling of three rides for 25 cents was reached, and under this rate it became apparent that the system could be operated to carry the financial burden necessary under company control and management. At the termination of the receivership, Col. Thomas Fitzgerald was made general manager and later vice-president of the company. At this same time the president announced, among other things, the creation of a commercial department. The creation of this department embodied the management's belief that the sale of rides should be clearly separated from the manufacture of car-miles. So far as is known, it is the only commercial department on American electric railways organized with such broad powers. Its work, under the direction of a commercial manager, falls under the four main subdivisions of traffic, public relations, publicity and safety.

Traffic promotion is under a director, to whom the supervisor of investigations and his three investigators and the supervisor of checking and his ten checkers report.

The character and amount of publicity are specified by the commercial manager.

The director of public relations is a liaison officer in relation with the police and fire departments, county detectives and other municipal representatives. He is also the clearing-house for all complaints, commendations and suggestions from the patrons of the company. Whether these come in person, by mail or by telephone, no complaint is left unsettled. In the case of complaints by mail, personal visit at the home or office of the complainant is the regular practice. In other instances, where a laborer has been hunted up at his work, the employer himself has secured a new light on the earnestness of the management.

The chief aim of all of us, however, was to win back the popularity of the street cars and to bring back the patrons to their seats in the trolleys, and to this end we devoted our efforts.

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*Abstract of a paper before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

While the population of Pittsburgh proper is only about 650,000, the railway serves more than a million people. In 1926, 396,000,000 passengers were carried. In the same period, more than 40,000,000 car-miles were operated, with total revenue slightly in excess of $21,000,000.

Of this, $440,000 or about 2 per cent was miscellaneous revenue. A little more than half of it was received from four principal sources, namely, freight service, express service, power sales, and rental of tracks, equipment, and real estate. These sources are more or less familiar to all of you.

The largest single source of miscellaneous revenue is that of inside and outside advertising on the trolleys, the sum of this source totaling $148,350, which is more than one-third of the whole amount of $440,000 for the past year. Station privileges have been let to individuals for the selling of lunches, books, magazines, tobacco, etc., and to companies which have installed scales, automatic candy and chewing gum machines.

Of all the objects set before an electric railway management, that of securing more revenue from more, instead of less, riders should rank first and that of miscellaneous revenue should follow. It goes without saying that adequate revenue is necessary to the very life of a railway, but every means should be tried to secure such adequate revenue without impairing the railway's usefulness to the community. A change in fare which produces more revenue from more riders must enhance the good will of all who benefit from a growth in voluntary travel. This good will is often of such tangible value in leading to tax relief, new franchises and other advantages that one can really consider fare changes not from the standpoint of more gross but from the standpoint of more net. There are times when it is wise to drop a possible $10,000 in gross receipts when the reward is relief from an assured $30,000 paving or other assessment.

FARE CHANGES WHICH HAVE POPULARIZED SERVICE

From the first, the Metropolitan Pittsburgh District was far too large to be a one-fare area. When the property was relinquished by the receivers, the fare structure, exclusive of the interurbans, and Washington City, was as follows: 10 cents cash or 8⅓ cents tokens (three for 25 cents) good for one zone from Pittsburgh center, a distance varying from 5 to 7 miles; 10 cents for fare including a crosstown transfer good for 1½ to 2½ miles each side of Pittsburgh center; 10 cents flat on owl cars; 10 cents cash or 8⅓ cents token for additional zones with some routes having four zones.

Analyses of traffic obtained during the course of different increases in fare revealed a loss in usefulness. This was especially apparent from the fact that, despite restrictions in their use, free transfers rose in number at the very time that cash fares dropped. It was obvious that the public was doing all it could to avoid extra fares—whether by changing jobs or residences or taking longer walks.

In trying to correct these conditions, the new management necessarily had to feel its way. The first changes were of comparatively trivial effect on revenue and riding, but they were a welcome indication to the patrons of the management's desire to do something at once. It will be seen that as time went on, the changes grew in importance until with the installation of the Pittsburgh weekly pass on June 1, 1925, the company offered to all regular riders within one zone of downtown Pittsburgh center a fare rate equal to or less than that of 5 cent days.

In the following chronology of changes in fares and fare collections, the transfer liberalizations covering more than 125 orders for more than 1,000 concessions have been omitted to avoid laborious detail. Some of these cut off a full fare, while others gave patrons the opportunity to reach their destinations via a greater choice of routes.

Fare changes which have resulted in an increase in gross include extensions of zone limits; establishment of reduced-rate short-haul fares, reduced-rate through or round-trip tickets; liberalization of transfer privileges; combination transportation - amusement tickets; extension of a car line at the same fare; increase in the age limit for children's free rides.

If a passenger inadvertently drops excess fare into the farebox, the conductor (or operator) is authorized to make a refund up to 50 cents on his own responsibility, and if a patron wishes to pay three standard fares at a time, 25 cents may be dropped into the box directly without the purchase of tokens.

Sunday and holiday passes, sold for 25 cents within one zone and 40 cents for the entire Pittsburgh district, were inaugurated. The success with these was so great that weekly passes were established in Washington and McKeesport. These also were successful. June 1, 1925, saw the start of the first unlimited-ride weekly pass used on any American surface railway serving more than 150,000 inhabitants. The cost of the pass is $1.50 or eighteen token fares, and it is good for unlimited riding by the bearer within the one-fare area from the center of Pittsburgh. Experience with the Sunday-Holiday pass in Pittsburgh and with the weekly pass in smaller cities indicates that the passholder averages a fare of 5 cents or less.

In some instances special shoppers' cars have been run by merchants, with a half fare to patrons. The railway has been given a guarantee in each case by the merchants, keeping all collections if over the guarantee. Chartered cars also are operated to a considerable extent.

Another enterprise affiliated with the Pittsburgh Railways is the Equitable Sales Company, which has several gas and electric shops in the Pittsburgh district. Through arrangements made with the sales company, the railways organization has increased the advance sale of its weekly passes, by issuing coupons on sale of passes on Friday, Saturday and Sunday previous to the week in which the pass is good, and by permitting pass holders to present their four or five coupons used each month as redeemable for $2 or $2.50 on the purchase of certain electric or gas appliances at these stores. Each coupon represents a value of 50 cents and may be turned in on the article offered for that month.

Another source of revenue is that derived from the operation of motor coaches. The Pittsburgh Motor Coach Company, the entire stock of which is owned by the Pittsburgh Railways, was formed after an agreement had been reached as to the price to be paid to the only operator of motor coaches competing with the railways. In general the length of ride of these routes is slightly more than 5 miles with a flat fare of 25 cents and these coaches, 36 in number, are being operated at a profit.

These for the most part are the methods in use on our property for developing miscellaneous revenue, but we do not feel that this type of revenue has been developed on our lines to the extent that it might have been if greater efforts had been made. There are many other plans in effect in other cities in the United States that are perhaps just as effective as those in use in Pittsburgh. These include the sale of space on the backs of transfers, installation of vending machines in the cars, rental of entire cars during the off-peak periods for advertising, sale of tickets with coupons redeemable for merchandise, sale of rides to merchants by newspaper coupons for free transportation of customers, and rental of the entire street car system to department stores or other merchant groups.

American Association News

Membership to American Electric Railway Association Increased

THE American executive committee at its June 3 meeting approved for membership the following operating, associate and manufacturer member companies, together with new individual members. These applications were made for membership since the executive committee meeting held April 1, 1927, and reported in ELECTRIC RAILWAY JOURNAL for April 9:

COMPANY MEMBERSHIP

Operating Companies

Compania Chilena de Electricidad, Limitada, Santiago, Chile.

The Mississippi Power & Light Company, Jackson, Miss.

Manufacturer Companies

Walter Bates Steel Corporation, Gary, Ind.

Cinch Manufacturing Corporation, Chicago, Ill.

D. B. Flower, Philadelphia, Pa.

General Carbonic Company, New York, N. Y.

Guide Motor Lamp Manufacturing Company, Cleveland, Ohio.

Hunter Illuminated Car Sign Company, Flushing, N. Y.

India Tire & Rubber Company, Akron, Ohio.

Protext Glass Company, New York, N. Y.

Toledo Pressed Steel Company, Toledo, Ohio.

Edwin L. Wiegand Company, Pittsburgh, Pa.

New Individual Memberships

Affiliated with Member Company

Operating

Engineering

Herbert R. Bristow, general foreman Toronto Transportation Commission, Toronto, Ont., Canada.

Thomas F. Burke, engineer of car equipment Interborough Rapid Transit Company, New York, N. Y.

F. W. Drowley, roadmaster Toronto Transportation Commission, Toronto, Ont., Canada.

C. R. Kinnear, assistant engineer Toronto Transportation Commission, Toronto, Ont., Canada.

W. M. Raiguel, engineer of way Philadelphia Rapid Transit Company, Philadelphia, Pa.

Lewis E. Summers, assistant operating manager subway-elevated lines, Philadelphia Rapid Transit Company, Philadelphia, Pa.

Harry G. Werner, assistant electrical engineer Philadelphia Rapid Transit Company, Philadelphia, Pa.

Transportation and Traffic

Frank B. Adair, assistant general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Paul E. Coffey, clerk to superintendent of garage Montreal Tramways Company, Montreal, Que., Canada.

C. D. Hardin, traffic manager Interstate Public Service Company, Indianapolis, Ind.

Manufacturer

American

Walter T. Sheldon, railway representative Pratt & Lambert, Inc., Buffalo, N. Y.

Engineering

Walter A. Giger, electrical engineer traction division, American Brown Boveri Electric Corp., Camden, N. J.

J. F. Tritle, engineer Control Division, railway engineering equipment department, General Electric Company, Erie, Pa.

Not Affiliated with Member Company

Operating

Engineering

Harry F. Ferguson, general foreman Department of Street Railways, Detroit, Mich.

William Machleit, general inspector Department of Street Railways, Detroit, Mich.

T. Sakamoto, Japanese Government Railways, New York, N. Y.

Kagoro Ochiai, electrical engineer Electric Bureau, Japanese Government Railways, Tokio, Japan.

Maurice Toby, assistant supervisor of way and structures, Eighth & Ninth Avenue Railway, New York, N. Y.

Manufacturer

American

Mrs. A. Fenton Walker, United States and British representative *Canadian Railway and Marine World*, New York, N. Y.

American Executive Committee Meets

SUBJECTS of major importance occupied the attention of the American Electric Railway Association executive committee at a busy meeting held at association headquarters in New York on June 3, 1927. Those present included the following: W. H. Sawyer, president; R. P. Stevens, J. H. Hanna, L. S. Storrs, F. R. Coates, C. B. Proctor, Daniel Durie, J. V. Sullivan, Harry Reid, C. E. Morgan, E. P. Waller, B. A. Hegeman, Jr., T. A. Kenny, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, L. C. Bradley, H. L. Brown, T. W. Casey, E. B. Meissner, Robert I. Todd, C. D. Emmons, A. W. Brady, Gen. G. H. Harries, Edward Dana, H. B. Flowers, H. L. Mitchell, T. R. Langan, J. W. Welsh and Mr. McKay representing G. H. Ernsberger of the Oklahoma Utilities Association.

A report for the publicity committee made by Barron Collier, vice-chairman, was read by Secretary Welsh. The committee reported the preparation of three new posters since the last meeting. The subjects are traffic congestion, shop or carhouse safety and interurban merchandising. Interurban poster service is being broadened by the committee. At least one out of each three posters prepared is now being directed to interurban work. Plans are being made to issue some large one-sheet posters directed to merchandising interurban freight.

The booklet on electric railways for use in schools has been thoroughly revised and is being offered to individual companies. It has been distributed to the extent of 20,000 to the New England district by the New England Committee on Public Utility Information and to the extent of 5,000 in Indiana by the Indiana committee. In other states it has gone forward to the individual member companies.

Under the supervision of the Board of Education in Cincinnati a booklet on the Cincinnati Street Railway has been prepared and distributed among Cincinnati schools. Copies of the book have been distributed to member companies with the suggestion that they might do well to follow a similar plan with the schools in their respective localities.

Reporting for the membership committee, Chairman C. R. Ellicott took occasion to stress the importance of membership to the existence and progress of the association. He characterized a continual flow of new members as constituting the very lifeblood of the association and made a plea for co-operation on the part of each member of the committee and of operating executives interested in the association's progress, even though they are not active members of the committee. Two new operating company members, ten manufacturers, and 21 individual members were reported since the last meeting of the executive committee.

Chairman C. E. Morgan for the finance committee reported that there had been a reduction made in operating expenses for a period of six months amounting to $17,477. This, he said, had been brought about through the full co-operation of the association's operating staff.

Harry Reid, chairman of the committee on national relations, said that there are no problems which require the attention of his committee at the moment. He took occasion to compliment Managing Director Storrs and the members of the sub-committee on depreciation, who succeeded in winning a postponement of the depreciation hearing before the Interstate Commerce Commission in order to give the industry time adequately to prepare its case.

A report of the committee on co-operation with manufacturers was read by Secretary Welsh. Booklets reproducing an address by City Manager Sherrill of Cincinnati have been distributed by the committee through the manufacturers. Two posters for use on bulletin boards and stickers for use on freight and express packages have been offered to manufacturers. The committee has decided to issue two booklets, one dealing with the sale of car rides and the other directed to electric railway salesmen to point out how they may help in stimulating the adoption of better methods of getting business.

The committee is going to make a special effort to induce manufacturers to visit the electric car exhibit at the convention this year. A letter also has been written to the editors of the various trade journals asking them to run editorials just before the convention urging all exhibitors to visit the electric car exhibit and take some customers with them. A letter also will be sent by the chairman of the committee to manufacturer members shortly before the convention urging them to fall in line with this work.

A suggestion by Chairman F. R. Coates was made in behalf of the committee on co-operation with state and sectional associations, for the coming Cleveland meeting. He felt that it would help to foster a spirit of co-operation if there could be a meeting arranged to include his committee, the executive committee and representatives of the various sectional associations. This matter was referred to the committee on meetings and subjects.

Work of the committee on revision of the constitution under the chairmanship of C. D. Emmons was taken up in detail. The revised constitution was adopted by the executive committee for presentation at the convention. At the suggestion of the executive committee a statement will be prepared by Mr. Emmons' committee explaining, for the information of the industry, the principal changes made in the constitution and the reason for this action.

A report was submitted by the special committee authorized at the last executive committee meeting to devise if possible a plan to carry out the recommendations made by the policy committee in regard to changes in the association's publishing policy. The report indicated that the policy committee's recommendations in favor of reducing the publishing cost of *Aera* and bringing about greater co-ordination between the association and the technical press to minimize duplication can be carried out in the interests of the industry. This report was received by the executive committee on motion of R. P. Stevens. The publications committee was instructed to carry out the plan outlined by the special committee and to make this effective at as early a date as is practicable.

The sentiment of the manufacturers regarding various features of the exhibit was expressed in the report of a special committee under the chairmanship of T. W. Casey. Its recommendation favored keeping the exhibit closed to the public. In addition it recommended that the showing of baseball scores as prominently as was done last year be eliminated. Stimulation of attendance at the exhibits when they are opened on Saturday noon was strongly urged. A suggestion was made that week-end trips for employees in the vicinity of Cleveland be arranged.

The date and place of the next meeting was left to the president.

The News of the Industry

New York State Men Reject Renewal Proposal

For the second time within a month employees of the Rochester, Utica and Syracuse lines of the New York State Railways voting simultaneously rejected the proposal for renewal of the 1926 wage agreement. The vote was 883 to 652. The proposal had been rejected previously by 133. It is believed that arbitration will be resorted to, although further bargaining is being carried on in the hope of framing a satisfactory contract.

Rehearing Sought in Des Moines One-Man Car Issue

The Des Moines City Railway, Des Moines, Iowa, has filed application for a rehearing before the Iowa Supreme Court, which on April 7 handed down a decision upholding the validity of an agreement between the company and the street car men's union requiring the presence of a motorman and a conductor on every Des Moines street car. In the application the company sets forth that the twenty-year agreement between the car men and the company, which has been in effect since 1915, is in violation of the public interest; that lack of a decision by the court on the validity of the check-off places the company and the public in continual jeopardy of a strike; that the section of the agreement which prohibits one-man cars is void, and that the entire contract is void because it unionizes an entire industry in the community. The petitioner takes issue with the former decision of the court with regard to the right of the company to question the agreement or contract with the car men. It is claimed by the company that under the provisions of a service-at-cost franchise it has an "indisputable status as a representative of the public interest."

In part, the petition declares:

> The 1921 franchise provides for street car service at cost and for a variable rate of fare which fluctuates with the cost of production of service to be given by the company under the franchise. It is thereby demonstrated that the public in general and the car-riding public in particular is vitally interested in the cost of production of street car service in Des Moines. The higher the cost, the higher the rate of fare, and the cost of a ride is correspondingly greater to each individual rider.
>
> The public now has a very direct financial interest in the street car business and is quite directly interested in the inauguration of improvements that will lower the cost of operations, and hence tend to lower the cost of fare to be charged. And the public is vitally interested in the elimination of anything which tends to impair the ability of the company to perform its duties and obligations under the present franchise.

Meanwhile the company continues to show increasing monthly operating deficits under two-man operation. The report of the auditor for April showed that the deficit for the month was $10,875 and that the total accumulated deficit to the stabilizing fund was $47,417 as of April 30. The company is still operating under a 10-cent cash fare and a weekly pass which sells at $1.25. The pass is transferable and good for any number of rides during the seven-day period. The total weekly sale runs from 10,000 to 12,000.

Public Hearings on Chicago Enabling Bills

Mayor Thompson Gives Full Approval to Bills as Amended by Aldermanic Body—Senate Passes Two of Five New Railway Measures

RESPONDING to pressure brought to bear by a number of questioning Senators and by various civic organizations in Chicago which have insisted that the bills are being rushed through to a vote without an adequate opportunity for study and discussion, the joint committee on public utilities of the Illinois State Legislature called a final public hearing on June 7 for the five enabling bills introduced last month by the Chicago transportation companies. The bills had been reported out and recommended for passage by this committee on May 31, after two days of public discussion, and are already on the second reading in the Senate. It was for the purpose of giving every one an opportunity to suggest any amendments which in his opinion might improve the bills and of correcting what it was feared might arouse unfavorable public and newspaper opinion that the hearings were reopened. Another reason for delaying action on the bills was said to be the hesitancy on the part of several senators to pass on the bills without first obtaining the views of Mayor Thompson.

AMENDMENTS TO BILLS DROPPED

The Senate passed and sent to the House on June 9 two of five Chicago traction bills. Others were scheduled to pass on June 10 unless sentiment changes radically. The subway bill won by 30 votes to 20. The second bill rescinding the twenty-year franchise limitation was approved by 34 to 8. The majority of the amendments proposed to both of these bills were dropped.

Objections to certain features of the bills were loudest from the quarter of the local transportation committee of the City Council, where bill No. 5, which would amend the state utilities act and provide for control of the consolidated system by a mixed commission of city, county and state appointees with jurisdiction over lines in every part of Cook County, was closely scrutinized for possible omissions and clauses liable to be misinterpreted. Notwithstanding Mayor Thompson's approval of the basic principles involved and his conviction that this bill gives the largest possible measure of home rule consistent with the laws of the state and the early solution of the problem as a whole, the Aldermen found much to be desired in the bill in its present form. They are opposed to the clause which makes the proposed county transit commission subject to supervision by the Governor and financially supported by the state, declaring that such terms remove the last vestige of local control of the city's transit system from the City Council. The local transportation committee has been a consistent advocate of the previously reported Durso bill, which proposes to take control of the Chicago local transportation agencies entirely out of the hands of the State Commerce Commission and vest it in a purely local body.

The committee also voiced objections against bill No. 2, which amends the cities and villages act of 1872 by dropping the twenty-year limit on future railway franchises and provides for the issuance of terminable permits. As a result of the hostility shown by several members, Corporation Counsel Samuel Ettelson was instructed by the committee to draft a substitute bill which will leave it discretionary with the City Council to grant term franchises or indeterminate permits.

In an address before the West Towns Chamber of Commerce, John M. Harlan, attorney for F. J. Lisman & Company, whose proposal to take over the surface lines under a twenty-year franchise is still pending before the local transportation committee, maintained that the bills are "full of dangerous jokers and are designed to put the city's transportation lines more firmly in the grip of Samuel Insull." He declared that passage of the bills would mean a perpetual franchise and would prohibit the city from granting a twenty-year franchise. A joker in Section 6 of the subway bill, he said, will mean the expenditure of many millions of dollars by the city in relocating public utility properties which interfere with subway construction. Failure of the drafters of the bills to say anything about a referendum was another point he attacked.

In answer to the statements made by critics of the measure, Mr. Insull said:

> Elimination of the present twenty-year restriction on street railroad grants is certainly not a "joker" as the term is commonly understood. Provision for this elimination is stated as plainly as possible in the

bills themselves and has been emphasized in all statements from proponents of the bills.

The only restrictions upon future action by the City Council in dealing with local transportation are that future street railroad grants shall be indeterminate during "good behavior" so to speak, and that terms and conditions be not inconsistent with existing law. It is expressly provided that street railroad construction or operation shall not be possible without the consent of local city authorities.

If the City Council does not want unification and development of local transportation and rapid transit, if it prefers to let the city stumble along under present conditions, it may do so.

The elevated loop is not involved in the proposed legislation. What may be done with the loop is a detail to be disposed of when the City Council undertakes to frame an ordinance for unification and development.

There is no reason why a referendum should be referred to by name or otherwise in the proposed legislation. The city authorities have full power to prescribe a referendum on any ordinance for unification and development that may be framed. If the City Council and the city administration can be trusted to deal with all the complexities of a grant for unification and development, surely they can be trusted to prevent any "fast and innocent stuff being pulled" by way of an indeterminate permit as an extension of the present temporary permit to the Surface Lines.

Whether these and kindred misrepresentations are made willfully or misunderstandingly, the effect of them is that of the traditional red herring drawn across the path of the proposed legislation. They only clutter up and confuse and impede full and frank discussion of the traction situation.

The principal defender of the measures was Patrick J. Lucey, attorney for the Insull interests. In explaining the provisions of the home rule and indeterminate bills, at which the heaviest opposition was directed, Mr. Lucey asserted that the home rule idea is the "most comprehensive and complete home rule plan that has ever been developed." On the question of terminable permits, he said: "Twenty years is too short a time to finance a big property. It cannot be done. An indeterminate franchise is necessary. This is the sanest and cleanest-cut plan that has ever been presented for a solution of the problem."

"Nellie Kelly" Goes Over Big in Buffalo

Employees of the Philadelphia Rapid Transit Company, Philadelphia, Pa., who presented George M. Cohan's musical comedy "Little Nellie Kelly" in the Academy of Music in Philadelphia earlier in the season, went to Buffalo and staged the show for three nights in the Teck Theater for the benefit of the Helping Hand Fund of the International Railway Co-operative Association of Buffalo. The theater was sold out for each of the three nights of the show. Almost 100 were in the cast, staged under direction of W. A. Costello.

Confer on Wages.—Negotiations are now in progress between the officials of the Connecticut Company, New Haven, Conn., and the executive committee of the trolley men's union, but no decision has been reached. It is said that the men are demanding a wage of 75 cents an hour for the operators of two-men cars and 15 cents an hour additional as the rate to be paid for one-man car operators. Eight hours instead of nine for a day's work is also asked.

Extension of San Francisco Municipal Railway Opposed

The question of municipal ownership as applied to water and transportation will be passed on by voters of San Francisco on June 14, when the fate of proposed bond issues totaling more than $50,000,000 will be decided. A two-thirds vote will be required to pass each of the five issues up for approval. The Chamber of Commerce has voiced its disapproval of the $4,700,000 bond issue for municipal railway extensions, and the passage of this portion of the bond program is very much in doubt.

The San Francisco Real Estate Board is another strong organization that has refused to sanction the idea of municipal railway extension bonds, declaring in a lengthy statement that at least two sections of the city in which it is desired to extend the car lines are already adequately served by the Market Street Railway.

At the present time the total municipal railway trackage in San Francisco is 69.4 miles. The new bonds provide for 29 miles of additional track.

The bonds, if voted, will give the municipal line the use of the new Duboce tunnel into the rapidly growing Sunset district. This tunnel was built by special assessment of the property owners at a cost of $1,250,000.

Another tunnel use of which is desired for the municipal line is the proposed Bernal cut, for which bonds amounting to $1,400,000 are asked of the voters in Tuesday's election. This is a surface tunnel in the Mission district, linking that district with the new Excelsior district now served by the Market Street Railway.

Other extensions for which bonds are asked are: Marina Loop, to cost $94,000; Balboa Street line to the beach; Taraval Street line, along the beach to the Fleishhacker Pool, a favorite playground in the city, and the Eureka Valley extension, which Mayor James Rolph personally sponsored.

Even friends of the bond issue admit that the Eureka Valley extension is unnecessary at the present time and will probably cause a deficit, as the district is now adequately served by the Castro line of the Market Street Railway. It is pointed out, however, that the franchise of the Castro line has not long to run.

It seems likely that the voters will approve $40,000,000 bonds to purchase the distributing system of the Spring Valley Water Company, as only slight opposition has apparently developed to this plan.

Ten Cents Sought in Atlanta

A petition of the Georgia Power Company to charge 10 cents for a cash fare and 25 cents for three tickets in Atlanta, Ga., was filed on June 3 with the Georgia Public Service Commission.

In its petition the company states that at the present time the railway in Atlanta is failing to yield an income of 8 per cent by approximately $1,000,000 a year.

The request is in line with a sliding scale of rates proposed more than a year ago, when a survey was made of the entire railway situation and it was agreed that if the present rates did not provide the necessary funds a reasonable increase in rates would be granted.

Rates at the present time are 7 cents for a cash fare and 20 cents for three car tickets, with fifteen tickets sold for $1. These rates went into effect in 1920, at which time the fare was increased from 6 to 7 cents.

Six Months' Respite to Be Asked in St. Louis Fare Case

City Counselor Muench of St. Louis, Mo., plans to ask the Missouri Public Service Commission for six months' time in which to prepare the city's defense to the application of Receiver Rolla Wells of the United Railways for an 8-cent fare and a valuation in excess of $75,000,000. If the commission grants the city this concession it is probable it will sanction temporary relief for the railway in the form of some increase in fares, possibly two tokens for 15 cents. The present fare is 7 cents.

COMPARISON OF THE EARNINGS OF UNITED RAILWAYS, ST. LOUIS, MO., FOR YEAR ENDED DEC. 31

	1926	1925
Gross operating revenue....	$18,873,431	$18,894,575
Expenses, depreciation and taxes..................	16,445,146	16,494,778
Operating income..........	$2,428,295	$2,399,797
Other income.............	202,874	285,450
Gross income.............	$2,631,168	$2,685,247
Interest and miscellaneous charges................	2,677,569	2,892,515
Loss from operations.......	$46,400	$207,268
Rental from bus equipment.	2,836	1,094
Net loss for year..........	$43,564	$216,174

The company at the recent hearing on the petition claimed that its reproduction cost new, less depreciation, is $98,573,264 for operating property. Its actual investment cost for the operating property was $59,958,352. Somewhere between this range of $40,000,000 it hopes to have its rate-making valuation set and to be permitted to earn 8 per cent on such valuation.

In the negotiation between the city and the company relative to a 30-year service-at-cost franchise the St. Louis Public Service Company, which will succeed the United Railways under foreclosure, has sought to obtain a 7 per cent return on a valuation of $58,700,000, which the commission set some time ago. A 7 per cent return on $58,700,000 would be $4,109,000, while 8 per cent on $75,000,000 would be $6,000,000. To net the latter amount the company would need a 9-cent fare. At present the company earns only 4.2 per cent.

The net loss of the company for the year 1926 was $43,564, compared with a loss of $206,174 in the preceding year. A summary of the statement of earnings contained in the pamphlet report of Receiver Rolla Wells as filed with the United States District Court is contained in the accompanying table.

Wage Issue in Chicago Becomes Acute

Demands of some 15,000 platform men and other classes of employees of the Chicago Surface Lines, Chicago, Ill., for a wage increase of 15 cents an hour were denied recently by the companies' executives. The latter have countered with a proposal to reduce the men's wages 5 cents an hour below the present scale of 75 cents an hour.

As a result of the management's action members of the local street and electric railway employees' union voted on June 6 to hold a strike referendum. If voted, the strike will not be immediate, but will be called at the instance of President William Quinlan of the union, should he be unable to reach a satisfactory wage agreement with the Surface Lines. The street car employees have been working without a wage contract since negotiations for a 5-cent increase failed a year ago this month.

Following the refusal of the Chicago Rapid Transit Company to consider a demand for a 15-cent increase over the present 72-77-cent hourly wage rate, 5,000 elevated trainmen are also expected to hold a strike referendum.

Negotiations of this company for a new scale to replace the agreement which expires May 31 were opened several weeks ago. At that time Vice-President Bernard J. Fallon informed the union representatives that conditions did not warrant the paying of increased wages and asked the men to accept a cut of 15 cents an hour. A wage increase of only 5 per cent, he contended, would wipe out the company's operative profit.

Medal for Safety in Atlanta

A gold medal, to be known as the Cody Safety Medal, has been offered by Chief William B. Cody of the Atlanta fire department to the Atlanta (Ga.) trainman who completes the year 1927 with the best safety record. It is probable that the medal will be offered each year in the interest of promoting greater safety in the city.

Dedication of Business School of Harvard University

In the presence of a great throng of distinguished visitors, the new buildings of the Harvard Graduate School of Business Administration were dedicated at Boston on June 4 with addresses by Owen D. Young, former Dean Edwin F. Gay, Dean Wallace B. Donham and others.

George F. Baker of New York, donor of the magnificent group of new buildings designed to house the activities of this notable school of economics, finance and commerce, presented the keys to President Lowell of Harvard University and added another $1,000,000 to the $5,000,000 already given by him to the institution.

In his address Mr. Young outlined the evolution of trade from primeval days, discussed the increasing trend toward high ethical practices in modern business, emphasized the rise of the trade association as a factor in creating sentiment, and dwelt upon the growing importance of investment sharing by labor in the enterprises in whose responsibilities it is increasingly concerned. The part such an institution as the Harvard school may play in economic problem research and in training men for business as a profession was comprehensively outlined. Mr. Young said that he regarded the question of unemployment as one of the most important to which consideration should be given.

East St. Louis Cuts Fare in Lean Hours

To encourage travel during the hours of the day and evening when patronage has been lacking of late, the East St. Louis & Suburban Railway, the East St. Louis Railway and the Alton, Granite & St. Louis Traction Company, all operating in and out of East St. Louis, Ill., will offer bargain rates during certain periods of the day in June, July and August. Non-rush-hour tickets will be sold at the rate of seven for 50 cents, compared with the regular rate of 10 cents or five tokens for 40 cents. The bargain tickets are good all day Sunday and on weekdays from 9 a. m. to 3:30 p. m. and 7 p. m. until 11:59 p. m. On the suburban lines the tickets will be accepted in part payment of fares and with the addition of 5 cents in cash will be good for passage across the Eads Bridge to St. Louis during non-rush hours.

The innovation resulted after several weeks of careful study of railway conditions in St. Louis, East St. Louis and other large cities. It was found that from 6 a. m. to 8 a. m. and from 5 p. m. to 7 p. m. the railway facilities are often overtaxed, while travel is light at other times.

Attention! National Safety Council Members

THERE was a wave of new members during the month of May. Going along from day to day, we are apt to forget how great the power behind the safety movement has grown to be. Yet when the need arises the membership behind the National Council grows beyond all expectations.

We are growing—eight out of the last ten months have shown an increase in members over the same months of the year before. Nothing can stop us from continuing our growth; eventually the safety movement will reach every person in the United States. Real loyalty, one of the finest things about the National Council, will take care of that.

All of us know that we are dependent on the members we now have to get new members. Will you use your influence to add to our size and to the strength of the safety movement? Will you take the application with you and go out and see a prospect?

WALTER G. KING,
President.

Wage Agreement in Winnipeg

A three-year wage agreement effective May 1 has been reached between the Winnipeg Electric Company, Winnipeg, Man., and its trainmen. It provides a general increase to motormen, conductors and bus men of 1 cent an hour, with an annual increase thereafter of 1 cent an hour, until the former maximum rate of 60 cents an hour to two-man operators is re-established on May 1, 1929. A. W. McLimont, president, made the proposal to the men. He said that he had in mind the necessity for stabilizing relations between the company and its employees and thus obviating the necessity of annually discussing wages or appearing before boards of arbitration or conciliation, with resultant loss of time and effort to both parties. He said he now looked forward "to three consecutive years of wholehearted co-operation between men and management."

Line from Grand Rapids to Jenison to Open Up

Officials of the United Suburban Railway, Grand Rapids, Mich., successor to the defunct Grand Rapids, Holland & Chicago Railway, announce that the Michigan Public Utilities Commission has approved the new company's organization and that operation of cars between Grand Rapids and Jenison, the two terminals of the new road, will be started by June 15. The opening of the new road, which will partly replace the old Holland division of the Michigan Railways, will be the signal for a public celebration that is being arranged by the Grandville Business Men's Association. The officials announce that Gov. Fred W. Green will be invited to officiate as motorman on the first car to be run over the new line, and invitations will be extended to merchants and citizens at all points along the route. Grand Rapids business men and state officials are expected to be guests.

At a meeting of the directors on June 3 the trolley wires were ordered to be replaced and everything put in readiness for immediate operation. This action was taken to anticipate the arrival of five used cars recently purchased in New York that have been remodeled and are expected from the East at once. The operating company is composed of 700 residents in the different communities served. It has 7 miles of double track and will operate through Galewood, Burlingame and other places en route to Jenison.

Omaha Franchise Debated

All efforts to compromise the matter having failed, the City Council of Omaha, Neb., has appropriated $5,000 to finance the defense of the city in the suit brought in federal court by the Guaranty Trust Company, New York, representing the bondholders of the Omaha & Council Bluffs Street Railway, to test the question of whether the company has a perpetual franchise. The city maintains that the franchise is a terminable one and will shortly expire. The money appropriated is to enable the city attorney to employ other competent legal help, since Corporation Counsel Lambert has resigned.

Recent Bus Developments

Bus Route in Jamestown to Replace Car Service

A proposal to abandon the present Lakewood street car line out Fairmount Avenue and replace it with a bus route from Jamestown, N. Y., to Lakewood was laid before the City Council on June 6, when the Jamestown Motor Bus Transportation Company and the Jamestown Street Railway made formal application for a franchise for the new bus route. A public hearing on the application will be held by the Council on June 17. Meanwhile the transportation companies will seek the consent of the Public Service Commission to abandon the trolley line and will request the village of Lakewood for a bus franchise. It is proposed to have the new bus route in operation by July 1.

In the application for the franchise Marion H. Fisher, attorney, explained that the decision of the street railway to abandon the old Fairmount Avenue line to Beechwood and Lakewood had been contemplated for some time because the line had been losing money. The necessity for repaving the company's tracks in Fairmount Avenue had brought the question to a head.

The new line, Mr. Fisher explained, will become a part of the present street car and bus transportation system and the same rate of fares, with transfer arrangements that now exist, will be applied. Three new buses will be purchased, two of them to be used on the Lakewood line and the third to augment the city transportation system.

Chicago Motor Coach Officials Favor Traction Unification Plans

In the discussion of ways and means to bring about unified operation of the various local transportation systems in Chicago in conjunction with a final settlement of the problem, inclusion of bus lines has been taken for granted. The enabling bills prepared by the railways and introduced in the Legislature permit, but do not make obligatory, operation of buses by the new company to be formed to operate the surface, elevated, and subway lines when built.

Although no formal statement of their attitude toward the unification plan has been made by the Chicago Motor Coach Company officials, it is understood that the company is generally in accord with the plan as developed by the surface and elevated lines executives. The terms on which the bus properties would be taken over by the consolidated company have not been evolved.

According to John A. Ritchie, president, the business of the Motor Coach Company has been developing favorably this year, with gross income for the first four months of $1,766,220, compared with $1,559,865 in the corresponding period of 1926, and net income totaling $133,205, or more than three times the $39,921 of net income for the first third of last year.

Mr. Ritchie and other officials are of the opinion that unification of transit facilities offers the best solution of the local transportation problem. Their own plan for substitution of buses for street cars under a twenty-year franchise, which was presented to the City Council last November, probably will not be pushed, if the present traction bills meet with legislative and popular approval. They believe that the motor coach will serve two main purposes in such a consolidation: (1) Transportation on boulevards, in parks and other sections of the city not reached by electric cars, and (2) operation as a feeder to elevated, surface and subway lines.

Definite Action Awaited in Columbia

The transportation problem in the city of Columbia, S. C., has reached a stage where definite action by the City Council is imperative. The matter has grown more complex since March 11, when the cars of the Columbia Railway, Gas & Electric Company ceased to function.

The service had been discontinued without notice to the Railroad Commission. Complaint was made and the utility company was ordered to show cause before the commission why service should not be resumed. Following a hearing an order was issued requiring the railway to resume operations March 31. The company asked for a rehearing and filed a petition for permission to discontinue permanently the operation of railway service in Columbia and to surrender its franchise. The petition was granted by a majority of the commission, and now the Attorney-General has asked that further hearing be had in order that additional testimony may be taken.

Lack of patronage was assigned as the reason for the discontinuance of trolley service. Before the cars were removed the Carolina Transit Company began operating buses, interchangeable transfers being used with the street cars. After the street cars were abandoned bus service was expanded and soon a score of machines, each of 29-passenger capacity, were operating. Meanwhile the 10-cent jitney, a considerable factor in cutting down the revenue of the street cars, was operating everywhere, running in front of and behind buses, picking up passengers and cutting deep into the prospective revenue of the bus company. The bus concern began losing money and became more and more involved as it began to limit its service and as the number of unrestricted jitneys increased.

Now the bus company has made a definite proposal to the City Council —either the jitneys must be kept off the streets on which the buses run or the buses will discontinue operations, and Columbia, which a few months ago had three systems of transportation—the street car, the bus and the jitney—will find itself with only one, the jitney.

Creditors of the bus company have agreed not to bring receivership or bankruptcy action against the bus company for a period of time, and the company from which the buses were purchased has agreed to take over the operation of the bus lines until it can work itself out of the bog. But that company will not take over the buses until the City Council passes an ordinance throwing some sort of restrictions around the operation of the 10-cent jitneys. The Council has not yet taken any action in the matter, though it has under consideration an ordinance which would give the desired protection to the bus company.

Motor Coaches to Replace Stamford Trolleys

A squadron of fourteen large city-type motor coaches left the shops at Long Island City on June 9 and, after parading the length of Fifth Avenue, Manhattan, headed toward Stamford, Conn., where they will go into service at 7 a.m. on June 12, replacing trolley cars of the New York & Stamford Railway.

The coaches will forge another link in the County Transportation Company's projected motorization of all interurban and local trolley lines serving Stamford, Sound Beach, Greenwich, Cos Cob, Mianus, Put's Hill and Chickahominy in Connecticut, and Portchester, Rye, Harrison, Mamaroneck, Larchmont, Larchmont Gardens, Larchmont Manor, Rye Beach, Oakland Beach, Milton Point and New Rochelle, all in the Long Island Sound section of Westchester in New York State.

Garage facilities for upward of 80 buses have been installed at Portchester on the site of the carhouse of the New York & Stamford Railway.

Although Portchester locally is served exclusively by the motor coaches, local officials have not yet consented to permit the County Transportation Company to operate motor coaches over the main-line trolley right-of-way, which passes through Portchester en route from Stamford to New Rochelle. The main-line trolleys will therefore continue to operate from the Connecticut border southward to New Rochelle, while the motor coaches will operate between Stamford and the state line. For the present, at least, passengers will transfer from trolley to motor coach or vice versa at the bridge which marks the state border.

The fare will be 10 cents per zone, or 20 cents from Stamford to the state line, as compared with the trolley rate of 7 cents per zone, with approximately three zones between Stamford and the state line.

The delay in Portchester's consent to the operation of interstate coach service over the main-line trolley right-of-way is apparently the only remaining barrier to the complete abandonment of the railway system and installation of motor coaches on all the routes now covered by the trolley lines.

Action on New York Franchises Again Postponed

The Board of Estimate of New York City on June 3 again postponed action on applications for bus franchises. When the bus franchise item was reached on the calendar, Borough President John A. Lynch of Richmond, believed to be one of Mayor Walker's supporters for a grant of a franchise for Manhattan, Brooklyn and Queens to the Equitable Coach Company, moved that it go over for one week. There was no objection to the postponement. After the meeting, it was said the deadlock in the board on the granting of bus franchises was apparently so pronounced that there was little hope of action before the fall.

Rights Granted Utah Company

A certificate of convenience and necessity, permitting it to operate as a common carrier by rail and by stage between Ogden, Utah, and the Utah-Idaho state line and intermediate points, has been issued to the Utah-Idaho Central Railroad by the Public Utilities Commission of Utah. The company also was granted permission to operate a bus line for the transportation of passengers over the streets of Logan, Utah. All the rights and privileges formerly enjoyed by the old Utah-Idaho Central Company were granted to the Utah-Idaho Central Railroad in the certificate.

Buses to Replace Trolleys. — The Board of Public Utility Commissioners of New Jersey authorized on May 28 abandonment of trolley service by the Public Service Railway between Main and Day Streets, Orange and Elm Streets and Bloomfield Avenue, Montclair. Buses will be substituted.

Replace Cars Temporarily. — The Carolina Transit Company, a bus company operating out of South Carolina, has established a bus line at High Point, N. C., to replace the North Carolina Public Service Company, operator of the electric railway system in that city. According to officials of the company, the replacement of bus service by railway service is only a temporary arrangement, it having been mutually agreed to give the bus concern an opportunity to furnish the transportation service. The company has six buses in High Point, five of which are operating on twenty-minute schedules and one of which is used for reserve. Four of the bus lines traverse the same territory as the railway, while one bus operates on a crosstown route.

Decision Withheld Following Hearing. — The Public Service Commission held a public hearing on June 7 on the petition of the Capitol District Transportation Company, Inc., for permission to operate a bus line between the cities of Albany and Rensselaer. This company is a subsidiary of the United Traction Company.

Two Buses Serve.—The Rockford & Interurban Railway, Rockford, Ill., has placed two buses in daily operation connecting Beloit, Janesville and Rockford. Tickets are interchangeable between the two types of vehicles.

Financial and Corporate

Commission Will Approve Purchase of Baltimore Interurban

The acquisition of a controlling interest in the Washington, Baltimore & Annapolis Electric Railroad, with headquarters in Baltimore, by the Consolidated Gas, Electric Light & Power Company, also of Baltimore, will be approved by the Maryland Public Service Commission. The announcement of the plan to approve the deal was made after the commission had held a hearing on the subject on June 3.

The petition filed by the Gas & Electric Company requested that the commission approve its purchase of 45,433 shares of capital stock of the railroad through the medium of a holding company. More than $1,000,000 is involved in the transaction.

In acquiring the road the Gas & Electric Company will take over 54 per cent of the total stock. It also, as a part of the transaction, will acquire the Annapolis & Chesapeake Bay Power Company, a subsidiary of the railroad serving the residents of a large part of the territory between Baltimore, Washington and Annapolis with electric current.

In testifying before the commission Herbert A. Wagner, president of the Gas & Electric Company, said that the company had no intention of disposing of the property. He said the service will be improved still further and that efforts will be made to increase the freight traffic.

Stock in Mitten Investment Corporation Issued Publicly

Formation of a $50,000,000 investment concern whose stock at a par value of $25 was offered to the public on June 6 was announced in Philadelphia on June 4 by Mitten Management, Inc. The new organization is to be known as the Mitten Bank Securities Corporation.

The full authorized capital is $50,000,000, but the amount of the first stock issue has not been determined. Proceeds of the paid-in capital will be used for purchasing stock of the Mitten Men and Management Bank and Trust Company, the Philadelphia Rapid Transit Company and other concerns which Mitten Management, Inc., may operate.

The entire capital will be issued as common stock with full voting powers and with no fixed dividend rate. An official statement says:

> Mitten Bank was formed for the express purpose of providing a banking service for these new capitalists, (P.R.T. employees) and to meet their desire that the same advantages might be extended to other workers, to the end of helping labor to become capital. Within the past year the stock of Mitten Bank has increased to nearly three times its original price.
>
> The money paid in on Mitten Bank Securities Corporation will be largely devoted to Mitten Bank and its facilities and kindred activities, and to investments in and producing increased economic efficiency for P.R.T. and for other promising properties. All the profits will go to the Mitten Bank Securities Corporation stockholders.
>
> Nothing would please us more than to sell one share to every man, woman and child in Philadelphia. Such a wide distribution would advance the Mitten idea, which is to promote industrial democracy by spreading more widely the profits of industry.

T. E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company, made the following statement:

> Here is an opportunity for the public to own a part in the Mitten Bank and to participate in industrial, financial and public utility undertakings offering safe and profitable possibilities, assured of effective direction through the supervision of Mitten Management, whose policy of enabling the workers to participate in profits earned by increased efficiency not only insures the investment against loss by strikes and poor workmanship, but helps to establish a better order of society through labor becoming capital.

Traffic Fare and Wage Figures

Electric railway passenger traffic decreased slightly in April, 1927, compared with April, 1926. The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 216 companies is as follows:

April, 1927	835,658,373
April, 1926	837,210,029
Decrease, per cent	0.19

Average cash fare in cities of 25,000 population and over:

	Cents
May 1, 1927	7.8304
April 1, 1927	7.8194
May 1, 1926	7.6689

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913 = 100 Per Cent
May 1, 1927	57.09	209.50
April 1, 1927	56.97	209.06
May 1, 1926	56.72	208.15

Bonds Coming In for Terre Haute Change

At the close of business on June 1 91 per cent of the first and refunding mortgage 5 per cent bonds of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., had been deposited with the committee representing these bonds. There are eleven other classes of securities involved in the reorganization and of all classes together there has been deposited 83 per cent. One committee has yet to act on the plan before it is declared operative, after which it goes to the Indiana Public Service Commission for approval.

Under the terms of the plan, the securities of the companies to be merged will be exchanged for those of the Indiana Electric Corporation, an Insull company, the 5 per cent bonds of the Terre Haute, Indianapolis &

Eastern Railway receiving in exchange, par for par, a 5 per cent first mortgage and refunding gold bond of the Indiana Electric Corporation. This company has outstanding 6 per cent and 5½ per cent bonds under this mortgage, the former being quoted around 104 and 105. The Terre Haute, Indianapolis & Eastern 5s have continued to pay their interest and are quoted at about 89.

Expansion in Bus Business Improves Capital Traction Status

In his report to the stockholders for the year ended Dec. 31, 1926, John H. Hanna, president of the Capital Traction Company, Washington, D. C., states that it is encouraging to note that for the first time in several years an increase over the preceding year is shown in passenger revenue, accompanied by a slight reduction in operating expense. He said the gain in revenue was small and attributed it to the expansion of the bus business. Receipts from rail operation alone showed a slight loss. Net earnings for 1926 fell slightly under the requirements for a 7 per cent dividend, but the directors felt themselves justified in using undistributed surplus of past years to make up the small deficiency.

Net additions to capital accounts were $39,652. A credit of $63,821 to cars and car equipment was due to scrapping 122 obsolete cars and writing off the remaining ones to junk value.

On the subject of depreciation, the report states that the commission directed a change in the basis of accruing depreciation reverting to the lives of property and annual rates contained in the valuation order of September, 1919. Under the revised plan the company accruals through operating expense were $361,834, a reduction of $36,750 from the preceding year. The reserve increased during the year from $2,458,455 to $2,716,657. Tax accruals were $399,651, an increase of $13,407 from the preceding year.

Bus operations were carried on at a loss of $62,872. Mr. Hanna states, however, that this form of transportation renders an important service and the buses produce, as feeders, much revenue to the rail lines. No new lines were established nor any extensions made except the Hains Point sightseeing line in Potomac Park, operated in the summer only. This line showed a profit. Chartered bus business showed a substantial gain in gross and net revenue.

SUMMARY OF OPERATIONS OF THE CAPITAL TRACTION COMPANY FOR YEAR ENDED DEC. 31

		1926	1925
Passenger revenue, railway..		$4,415,319	$4,482,040
Bus revenue................		174,631	81,877
Special car revenue.........		48	60
Special bus revenue.........		3,822	95
Total revenue from transportation..............		$4,593,821	$4,564,073
Revenue from operation other than transportation.....		23,165	22,982
Railway operating revenue..		$4,616,986	$4,587,055
Operating expenses (66.70 per cent of gross revenue)		3,100,148	3,110,085
Net operating revenue....		$1,516,837	$1,476,969
Taxes assignable to transportation operations....		399,651	386,243
Operating income........		$1,117,186	$1,090,725
Non-operating income......		31,085	33,132
Gross income............		$1,148,271	$1,123,858
Deductions from gross income:			
Interest on funded debt.........	$280,300		
Interest on unfunded debt..	47,098		
Rent for leased road	13,692		
Income tax paid at source.......	4,317		
Total deductions.........		345,408	335,392
Net income..............		$802,862	$788,465
Profit and loss statement:			
Credits:			
Balance at beginning of year..	$1,478,246		
Net income for the year......	802,862		
Guaranty fund deposit with District of Columbia charged as an operating expense in prior years...	2,500		
		$2,283,608	$2,318,246
Debits:			
Dividends......	$840,000		$840,000
Additional federal income and other taxes for prior years...	32,967		
		$872,967	
Credit balance at close of year.................		$1,410,641	$1,478,246

REVENUE AND TRANSFER PASSENGERS CARRIED BY THE CAPITAL TRACTION COMPANY

	1926	1925
Railway passengers:		
Number of passengers carried at 8 cents..........	17,719,054	16,995,347
Number of passengers carried at 6¼ cents..........	43,128,140	45,066,128
Number of passengers carried at 5 cents..........	830,780	833,352
Number of passengers carried at 3 cents..........	383,007	345,131
Number of cash passengers carried on Kensington line..........	110,896	119,757
Number of ticket passengers carried on Kensington line..........	46,130	52,547
Total railway revenue passengers..........	62,218,007	63,412,262
Bus passengers:		
Number of passengers carried at 25 cents..........	343,899	71,466
Number of passengers carried at 10 cents..........	64,814	1,160
Number of passengers carried at 8 cents..........	310,085	252,588
Number of passengers carried at 6¼ cents..........	528,022	466,617
Number of passengers carried at 5 cents..........	60,511	640
Total bus revenue passengers..........	1,307,331	792,471
Total revenue passengers railway and bus..........	63,525,338	64,204,733
Other passengers:		
1-cent intercompany transfer passengers..........	2,814,693	2,759,208
2-cent bus to car transfer passengers..........	556,225	344,011
2-cent car to bus transfer passengers..........	374,550	310,712
2-cent Eastern High School ticket passengers..........	8	4
Free transfers passengers..........	16,982,373	17,111,342
Other free passengers:		
Employees..........	709,610	727,894
Policemen and firemen*..........	52,295	56,714
Total passengers..........	85,015,092	85,514,618

* Exclusive of policemen and firemen while in uniform.

Dividends Resumed in Duluth

The Duluth-Superior Traction Company, Duluth, Minn., has declared a dividend of $1 a share on its common stock, the first distribution to be made for some time on this issue. The regular quarterly dividend of $1 on the preferred stock was also declared.

Abandonment on Detroit United Line

Permission to abandon service on the Wyandotte and Trenton division of the Detroit United Railway, Detroit, Mich., has been granted the receiver, A. L. Drum, by William S. Sayres, Jr., master in chancery in the federal court. Service is being withdrawn and the tracks removed in order that the County Road Commission can carry out proposed paving operations south of Wyandotte. It was stated by the receiver that abandonment of service was due to financial losses attributed to jitney competition.

Abandonment of another branch of the interurban lines is urged in a petition made by the receiver, naming the Romeo-Imlay City branch, consisting of about 20 miles of trackage. A hearing on this proposed abandonment has been held before the standing master in chancery of the federal court and it was announced that a recommendation to abandon the line would be made to Judge Charles C. Simons. It was set forth that the line lost about $29,000 last year, due to lack of patronage and to competition of bus service, making it a serious drawback to the entire Detroit United system. It was Mr. Drum's opinion that if forced to continue in service this year the loss would probably be greater than that experienced previously. Citizens of Romeo, Imlay City and other towns along the route are to be permitted to voice their protests at a hearing to be held in the near future.

Sale of Morris County Traction Authorized

Sale of the property of the Morris County Traction Company, Dover, N. J., was authorized in an order signed on May 7 by Federal Judge Runyon. Elmer King, counsel for Joseph P. Tumulty and Joseph K. Choate, receivers, applied for the sale. The court named Charles F. Lynch, former federal judge, special master to conduct the sale. No date has been fixed for the sale. It will be advertised for at least four weeks.

Assets of the company will be offered in four lots. One will be the right to operate bus lines, another will include the right to operate railway lines and other rights under this franchise, the third lot will comprise the real estate and the fourth the personal property and equipment.

A minimum offer of $200,000 was fixed by the court in the sale order. This sum represents taxes and other priority liens. Any sum above that figure will be used to pay off some of the $3,750,000 in claims of mortgage and bond-holders.

Net Income Higher.—For the ten months period ended April 30, 1927, the total operating revenue of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., was $38,659,434, against $37,084,474 for a similar period ended the year previous. Total operating expenses increased from $24,158,645 to $25,095,326 in the 1927 period. After the consideration of income deductions, a net income remained of $5,188,965 against $4,631,470 for the ten months ended April 30, 1926.

One Line to Be Abandoned.—The line of the Warren Street Railway, Warren, Pa., operating between that city and the village of Sheffield, Pa., is to be abandoned, according to announcement made public by J. P. Fenstermacher, general manager at Warren of the Penn Public Service Corporation, which owns the line. The company also operates several loops in the city of Warren and an interurban line between Warren, Pa., and Jamestown, N. Y.

Net Income Lower. — For the four months period ended April 30, 1927, the passenger revenue of the United Railways & Electric Company, Baltimore, Md., was $5,424,915, against $5,510,614 for a similar period in the year previous. The net income was $242,228, against $281,708 in 1926.

Proceeds of Bonds for Bus Purchase.—In a supplemental order, the California Railroad Commission has authorized the Key System Transit Company, Oakland, Cal., to use $136,223 of the proceeds received from the sale of first mortgage 6 per cent gold bonds of series "D" to reimburse its treasury for the purchase of fourteen 26-passenger buses and other expenditures made prior to Dec. 31, 1926.

Would Suspend Service.—The Key System Transit Company has applied to the California Railroad Commission for permission to abandon car service between San Lorenzo Junction and East Fourteenth Street, known as the San Lorenzo branch line, in the county of Alameda. Abandonment is sought because the revenues are insufficient.

Partial Discontinuance in the Berkshires.—Through electric railway service between Bennington, Vt., and Hoosac Falls, N. Y., was discontinued on May 31 by the Berkshire Street Railway in accordance with orders issued by the Vermont Public Service Commission. This line was constructed 30 years ago by the Hoosac Falls Street Railway and was operated by that company until 1906, when it was acquired by the Berkshire Street Railway.

Surface Lines Traffic Shows Increase.—Increased riding on the cars of the Chicago Surface Lines has been reported for the twenty-third consecutive month compared with the corresponding month of the previous year. During April there were 132,604,753 riders, an increase of 1,151,854 over April, 1926, but a decrease of 4,422,574 below the preceding month. A total increase of 11,879,805 rides is shown for the first four months of this year. Divisible receipts of the companies after expenses, taxes and interest on purchase price in April were $398,114, against $387,898 in March and $308,417 in the corresponding month of 1926.

Book Reviews

Manual of Endurance of Metals Under Repeated Stress

By H. F. Moore, research professor of engineering materials, University of Illinois. New York, N. Y.: Engineering Foundation.

In 1919 the National Research Council, the University of Illinois and the Engineering Foundation joined forces to consider the problem of fatigue of metals. A number of industries cooperated in helping the undertaking by contributing funds, materials and information for the investigation. The information obtained has been collected, condensed and put in form convenient for engineering use. Most of the investigations are being continued and much research work remains to be done. Some work is needed of more fundamental character than any yet accomplished in order to determine the nature and the general laws of fatigue phenomena.

Some of the subjects treated include a historical review, machines and specimens for testing fatigue strength of metals, determination of endurance limits from data of fatigue tests, values of endurance limits for metals, stress raisers and fatigue failures in service. As the subtitle proclaims it, the book is a summary of views and test data, with instructions for their use.

Psychology of Selecting Men — New Second Edition

By Donald A. Laird. New York, N. Y.: McGraw-Hill Book Company. 345 pages. Price, $4.

This is the second edition of a scientific coverage of the fundamental consideration in selecting men. In this edition chapters have been added which point the way for the employment department to utilize definite tests in the selection of applicants. The contents include such headings as "Character Reading," "The Applicant's Industrial History," "The Limitations of Psychological Tests," and "The Emotional Make-up and Job Adjustment."

Doing Export Business

Compiled by Foreign Commerce Department of Chamber of Commerce. Washington: Chamber of Commerce. 64 pages. Price, 15 cents.

A new, concise, indexed guidebook for the American exporter has been published by the foreign commerce department of the Chamber of Commerce of the United States under the title "Doing Export Business."

Many manufacturers looking overseas for new markets have felt the need for some general survey of what considerations were actually involved in undertaking such a merchandising venture outside the United States. The apprehension of American producers over the intricacy and dangers of foreign marketing are allayed by the statement that:

> This class of business is similar in its main outlines to domestic business. Mastering the special requirements of export trade has not been found a difficult task by those who have set about it seriously.

The booklet then discusses the procedure necessary in surveying the export field, in establishing the export department, in promoting foreign sales and in filling export orders. The book's 185-item index indicates the comprehensive treatment of export business found within its 64 pages.

The Evolution of Overhead Accounting

Compiled by Department of Manufacture of Chamber of Commerce. Washington: Chamber of Commerce.

Fundamental principles to be taken into account by manufacturers in the proper treatment of overhead costs are set forth in a pamphlet, "The Evolution of Overhead Accounting," just issued by the department of manufacture of the Chamber of Commerce of the United States. It is intended to be useful to manufacturers in all lines.

"It is now generally recognized that overhead is the most important factor in cost accounting," the foreword states "Yet, until comparatively recently, even with improved methods in accountancy, the overhead content in the cost of a commodity has been roughly estimated or guessed at. Increasing competition, refinements in machinery and production methods and intelligence used in management have brought to the front the problem of more accurately measuring overhead."

Aware of the confusion among manufacturers over treatment of overhead, the chamber's department of manufacture has just completed a special study of the best methods of accounting procedure. The material developed is used as a basis for the pamphlet.

There are two divisions to the pamphlet. The first is devoted to the history of overhead accounting, showing various stages in the development of modern practice in such manner as to make clear the fundamentals in the accounting that are today recognized as important. Part second offers some suggestions to the manufacturer who wishes to improve his accounting procedure. E. W. McCullough, manager of the chamber's department of manufacture, announces that a copy of the pamphlet will be sent to any executive requesting it.

A Small Stockholder

By John T. Broderick. Schenectady, N. Y.: Robson & Adee. 127 pages. Price, $2.

Still another book has been added to the growing list of titles on investments and investment subjects intended for the general reader. This is auspicious, particularly since it is estimated that there are 7,000,000 stockholders in the United States, many of them small investors. There is no particular need, in a review of this kind, to go over the ground of the increasing growth of ownership in industry by the general public, but despite the lengthening list of books on investment intended for general consumption the subject has not been overdone.

The student of finance and the man of affairs might find the present volume too elementary for them, but there is a large class of investors, particularly employee-investors, who will find a perusal of its contents helpful and suggestive. And this is the class that needs the advice most. Having made a successful investment in the company with which he is connected, the employee often is easily intrigued into making other financial commitments which do not stand the test of time, either long or short. That is where the contents of this volume have their greatest value. One may or may not agree with the plan of the author suggesting a national association of stockholders, but one must agree, it seems, with the suggestion that the present volume is one that the individual employee-stockholder may well own to his own profit, and that the volume is one that should be on the shelves of the public libraries and in the reading rooms for employees. All this is said despite the fact that some statements of opinion in the volume are subject to challenge, not because they are understatements, but more because they are overstatements.

Facts and Figures of the Automobile Industry, 1927 Edition

National Automobile Chamber of Commerce. 96 pages.

In this eighth annual edition a number of facts and special studies are made available for the first time. Some interesting statistics, charts and maps are included to give the history of the automobile industry in the United States. The associations of that industry are listed with their main offices and officials. A motor bus table shows that electric railways and subsidiaries operated 7,284 buses as of Jan. 1, 1927.

Standards Year Book, 1927

National Bureau of Standards, U. S. Department of Commerce. 392 pages. Price $1.

The Standards Yearbook represents an effort to present an adequate picture of the diversification and ramification of the standardization movement which has spread throughout the world with astonishing rapidity during the 25 years that have elapsed since the establishment of the U. S. Bureau of Standards. It contains outlines of the activities and accomplishments of not only this bureau and other agencies of the federal government and the states and municipalities, but also of the American societies and associations of which standardization is a major or very important activity. As a companion volume to Commerce Yearbook, which deals strictly with industry and commerce, the Standards Yearbook deals strictly with standards and standardization. In this volume are correlated the essentials concerning standardization activities with which the Bureau of Standards is in close co-operation, and the subject of standardization is presented in its entirety. The Standards Yearbook will furnish the answers to a great volume of urgent inquiries received by the Bureau of Standards from manufacturers, industries experts, engineers and purchasing agencies, both governmental and general.

Forecasting Business Conditions

By Charles O. Hardy and Garfield V. Cox. New York, N. Y.: The Macmillan Company. 434 pages. Price, $4.

This book concerns itself with the study of those recurrent business maladjustments known as crises and depressions, considered not so much from the viewpoint of public economy as from that of the practical man of business and the investor. The book is made especially valuable by the study of the methods and forecasts of several well-known economic agencies, in so far as their work has to do with prediction of changes in general business activity. The various indices of production are discussed as well as the indices of employment, trade and business activity.

Tips on Leadership—Life Stories of 25 Leaders

By Herbert N. Casson. New York, N. Y.: B. C. Forbes Publishing Company. 224 pages. Price $2.

Men who aspire to become commercial magnates will welcome Mr. Casson's recipes for success in the business world. For some 60 pages he imparts hints on how to reach the top and wield the influence of the big business man. Then he tells the stories of 25 outstanding leaders who had a worthy purpose, were imbued with the spirit of independence and considered defeats as lessons. They are to serve as models for the impatient young American youth who, too, wants to become a leader.

If Mr. Casson appears to be platitudinous at times it is only because he, himself, has so firm a belief in the efficacy of these hints. His opening remarks on the necessity for quick decisions in a true leader are worthy of thought. He says: "A leader must reflect, he must plan, he must think. But he must not be like Rodin's 'Thinker'—sitting still and absorbed in his own reflections." Men intrusted with the management of utilities might read with profit his chapter "Reward Loyalty." Here are a few of his ideas:

> If an employer has men and women who have worked loyally for him for twenty years, and if he gives them nothing—no reward, no diploma, nor any sort of public praise, how can there be any loyalty in that firm?
>
> Are there not some firms that are forever changing their staff? Employees are always coming and going. Why? Because they are not fastened to the firm by loyalty.
>
> We have been hearing a good deal, in recent years, about labor turnover—the cost of new employees.
>
> We know now that a new employee costs from $50 to $200, what with the training and the loss by bad work and one thing and another.
>
> So you can see that loyalty is necessary and profitable. You can see that it is just as important as efficiency.

However, acceptance with considerable reservation is made of Mr. Casson's thoughts on learning to make news. That a leader must always be in full view and that no man can be a leader and a modest violet falls a little short of truth and idealism. "Be with the crowd and let them know where you are" is his tip for would-be leaders. Mr. Casson says: "If you have a dread of publicity, then sell out and live in retirement among your roses and rhododendrons and other dumb things." Not every one would consider roses and rhododendrons among dumb things.

The second part of the book contains an analysis of 25 personalities noted for their leadership. The list includes George Westinghouse, James Watt, Thomas A. Edison, Andrew Carnegie, Henry Ford, Elias Howe, Luther Burbank, Sir Isaac Newton and Thomas Huxley.

Occasionally the light and dark effects in Mr. Casson's pictures are a bit disconcerting. Doesn't Mr. Casson believe that more than Mr. Carnegie's heart would have been affected by the marriage of his daughter to a duke? Again, our credulity is strained when Mr. Casson remarks that Luther Burbank was so absorbed in work that he did not marry until the age of 71.

Undoubtedly the railway man knows a great deal of the life of George Westinghouse, but Mr. Casson's résumé will refresh his memory on the aspirations and accomplishments of that always earnest and ofttimes reckless pioneer. Besides, the author has something to say about "love in a railway coach."

"Tips on Leadership" is an earnest effort on the part of a leader in business in this country and abroad to put before aspirants "practical pointers on how to win leadership" His book purports to show the necessity for certain habit formations and character acquisitions if that goal is to be reached.

The "Electrician" Annual Tables of Electricity Undertakings, 1927

Benn Brothers, Ltd., London, England. 194 pages. Price, 10 shillings

This is the 40th edition, revised and containing details of several new undertakings, together with particulars of projected schemes. For the first time a comprehensive index covering the British tables A, B and C has been compiled and the Undertakings are not only set out in alphabetical order but the towns and even parishes receiving supply in bulk are also included. The contents show that colonial undertakings, foreign undertakings and British undertakings are included.

Corporate Resolutions

By Isabel Drummond. New York: Ronald Press. 321 pages. Price $6.

This volume is intended as a handbook for corporation executives, lawyers, accountants and others who are concerned with the management and operation of corporations. It combines a concise analysis of the law governing corporate resolutions, the medium through which corporate authority speaks, with annotated forms covering a wide range of corporate activity. There are 359 resolution forms covering stockholder's resolutions; directors' resolutions pertaining to internal transactions; directors' resolutions affecting third parties, and corporate notices. For convenience in use they are classified and divided into sections in accordance with the law governing stockholders' and directors' powers and the legal requirements concerning notice of action taken or to be taken.

Personal Items

C. O. Weidman in Guilford

C. O. Weidman was appointed general manager of the New Haven & Shore Line Railway, Guilford, Conn., on May 1. He entered the employ of what is now known as the Southern New York Power & Railway Corporation in 1898 and served successively as conductor, motorman, dispatcher and chief dispatcher. After a successful period in these rôles he was appointed superintendent of the property in 1906. Seven years later Mr. Weidman accepted an appointment as superintendent of the Morris County Traction Company, Norristown, N. J., resigning from that position in 1923 on account of ill health. During the next three years he was incapacitated and temporarily relinquished railway work. His next position was with the Altoona & Logan Valley Railway at Altoona, Pa., as superintendent in 1926. He was serving in this capacity when he resigned to accept the post of general manager of the New Haven & Shore Line Railway.

A. A. Hale, Griffin Wheel Vice-President

A. A. Hale, Eastern sales manager of the Griffin Wheel Company, Chicago, Ill., has been elected vice-president of that company. He will continue in the East, with offices in New York, in the capacity in which he has been serving, but with the added prestige which his election as a vice-president of the company carries. That prestige Mr. Hale has been building up with the company and in the steam and electric railway industry over a period of 22 years, for it was in 1905, just after his graduation from the University of Illinois as a mechanical engineer, that Mr. Hale went with the Griffin company.

He started at the bottom, a statement which in Mr. Hale's case means just what it says. The first title he had was mechanical inspector. Then came promotion after promotion, until in 1911 Mr. Hale was sent by his company to Boston as sales agent. For twelve years Mr. Hale circulated among the customers of the company who came under the range of territory included within the jurisdiction of that office. Then in January, 1923, he was sent to New York to represent the company and to operate for it with the title of Eastern sales manager. Few men in the steam and electric railway equipment field are better known than he. He was born in St. Louis, Mo., on May 1, 1883.

Promotions for Federal Light & Traction Men

At the monthly meeting of the board of directors of the Federal Light & Traction Company, New York, N. Y., J. Dunhill, who for many years past has been secretary and treasurer, and John D. Bowles, who for several years past has been chief engineer, were appointed vice-presidents of the company.

Among the subsidiaries of the Federal Light & Traction Company are the Hot Springs Street Railway, Hot Springs, Ark.; the Grays Harbor Railway & Light Company, Aberdeen, Washington, and the Springfield Railway & Light Company, a holding company.

Hugh Edwards Weyman Elected by Canadians

Hugh Edwards Weyman, manager of the Levis Tramways, Levis, Que., and well known in the manufacturing and operating end of the railway business, was elected president of the Canadian Electric Railway Association on June 2, 1927, at the annual meeting held in Winnipeg, Man. A year ago he was elected vice-president.

H. E. Weyman

Early in Mr. Weyman's career he was identified with the Westinghouse Electric & Manufacturing Company, where he took a special student's course, on the completion of which he was appointed foreman of the installation department and later general foreman of the insulation winding and transformer departments. On leaving the Westinghouse company he was engaged as foreman and later as general foreman at the armature winding shops of the Siemens Company, London, England. After some years with this firm he entered the services of the selling agents of the Gardner Oil & Gas Company, as sales engineer. His next position was general foreman of the electrical shops of the Canadian Allis-Chalmers Company, Montreal, and when this company was taken over by the Canadian General Electric Company, he entered the services of the St. Lawrence Bridge Company at the building site of the Quebec Bridge.

Leaving this company Mr. Weyman was engaged by the Levis County Railway and has been with it for the past ten years. During this time he has been responsible for the complete rehabilitation of the property, including the reconstruction of the track and construction of new car shops. Through his efforts the first installation of the Birney safety car in Canada was made.

Mr. Weyman was born in Guildford, England, on Aug. 27, 1883. He was educated at secondary schools and Cheltenham College and took the students' course in mechanical engineering and operation with the Great Central Railway.

Reorganization in Oakland

Departments of the Key System Transit Company, Oakland, Cal., have been reorganized, effective June 1, and what is sometimes called the "cabinet system" has been adopted. The changes in the internal organization of the company were made necessary by the resignation of George H. Harris as general manager and the abolition of that office. Under the new arrangement there will be five departments, the heads of which will report direct to Lester S. Ready, president. These departments will be known as and officered as follows:

Operating department, under James P. Potter, for many years superintendent of transportation. He will have charge of the operation of ferries as well as traction, Key division and buses. Capt. W. A. Rasmusen will remain as superintendent of ferries.

Engineering department, under H. P. Bell, who has been with the Key System for fourteen years and who has been chief engineer for the past two years. He will have charge of all construction and maintenance of tracks, equipment and ferries.

Financial department, under C. C. Vargas, who will have charge of all financial matters, auditing, accounting and purchasing. He is one of the youngest executives in the company and was formerly assistant to C. O. G. Miller when the latter was president of the Key System.

Public relations department, under Paul Goldsmith, who is a former Oakland newspaper man. Mr. Goldsmith will have charge of general public contacts, publicity, advertising and kindred matters.

Legal department, under W. I. Brobeck, Piedmont, as chief counsel and the firm of Brobeck, Phleger & Harrison in charge of general legal matters.

F. W. Frost remains as secretary and treasurer, positions he has held for 35 years.

Messrs. Davis and Boiselle in New Territory for Westinghouse Brake

E. W. Davis, for five years representative of the Westinghouse Air Brake Company at Boston, Mass., has been promoted to the position of Southwestern manager of that company with headquarters at St. Louis.

Mr. Davis was graduated from Purdue University with the mechanical engineering class of 1902. After several years of service with the Santa Fe and the Burlington railroads and a number of industrial concerns, including the Westinghouse Automatic Steam

Coupler Company, he entered the employ of the Westinghouse Air Brake in 1908. He was first an inspector, then assistant district engineer at New York. In 1919 he was promoted to be representative of the Westinghouse Traction Brake Company at that point. Since January, 1922, Mr. Davis has served as representative at Boston, a place which he relinquished to assume the more important duties in the Southwestern district.

Raymond Boiselle has been appointed representative of the Westinghouse Air Brake Company at Boston, Mass., succeeding Mr. Davis. Mr. Boiselle received his mechanical engineering education at the University of Illinois and early practical experience with the Missouri Pacific, Santa Fe and Rock Island railroads. Entering the service of the Westinghouse Air Brake Company in 1912, he was employed in the test department until 1917. During the World War he served as first lieutenant and captain, Aerial Armament Division, overseas, then re-entered the Westinghouse ranks as mechanical expert in the Southwestern district, where he remained until appointed representative in the Pittsburgh district in 1923. From this position he was transferred to the Boston office.

◆

Harry G. Taylor has resigned as chairman of the Nebraska State Railway Commission to become director of public relations of the car service division of the American Railway Association, with headquarters in Washington. In addition to his other duties Mr. Taylor has served for several years as chairman of the Central Western Shippers' Regional Board, made up of shippers and railroad representatives, and one of the instruments by which better understanding has been secured between shippers and carriers.

John E. Curtiss, Lincoln, has been named a member of the Nebraska Railway Commission to succeed H. G. Taylor, who resigned to become manager of public relations for the car service division of the American Railway Association. Mr. Curtiss will take charge on July 1 and will serve until a successor is elected in November, 1928. Mr. Curtiss served for seven years as secretary of the commission, but left last fall to take a departmental secretaryship with the Lincoln Chamber of Commerce.

John B. Reynolds, former general secretary of the Indianapolis Chamber of Commerce, has been appointed director of the industrial development department of the Middle West Utilities Company, Chicago, the parent corporation for utilities in the Middle West, many of which are in Indiana, where Mr. Reynolds is well known. Mr. Reynolds was general secretary of the Chamber of Commerce for seven years, but retired in March after that body was reorganized.

James P. Neal, city attorney of Walla Walla, Wash., has been appointed to the post of supervisor of transportation in the Department of Public Works of Washington at Olympia. Mr. Neal replaces O. O. Calderhead, resigned.

Changes Among Mitten Men

Mr. Myers, P.R.T. President, Becomes Securities Official—Mr. Senter to Head Railway

W. K. Myers has tendered to the board of directors of the Philadelphia Rapid Transit Company his resignation as president, effective July 1, 1927, in order that he may devote himself entirely to the position of executive vice-president of the newly organized Mitten Bank Securities Corporation, which has been created as a vehicle through which to advance the Mitten principle of industrial democracy, and stock of which is now being offered to the public.

W. K. Myers

The announcement to this effect was followed by a statement by T. E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company, on June 9 that he would recommend to the board the election of R. T. Senter as president to succeed Mr. Myers.

R. T. Senter

Mr. Myers was born in 1883 at Millville, N. J. He was educated in the public schools of Lancaster, Pa., and was graduated from Pennsylvania State College in the class of 1905. Mr. Myers was actively engaged in electric railway work in Chicago before he went with the Philadelphia Rapid Transit Company in 1919. Prior to his election as president at Philadelphia in 1926 he served as financial vice-president. He has the unusual distinction of combining an engineering training with a thorough financial education and experience. These attributes fit him eminently for the task of directing the destinies of the new corporation, in which the savings of small investors will be reposed.

Mr. Senter has been associated with Mitten Management for twenty-eight years. He is now vice-president of the Philadelphia Rapid Transit Company. Mr. Senter was born in 1876 in Columbus, Ohio. He was educated in the public schools of that city, Michigan Military Academy and the University of Michigan. He received his engineering education at Armour Institute of Technology and his practical experience with the Twin City Rapid Transit Company, International Railway, Chicago City Railway and Philadelphia Rapid Transit Company. During recent years he has specialized in electric railway car design, high-speed planning and subway-elevated construction.

ROSTER OF NEW INVESTMENT COMPANY

As for the newly-formed Mitten Bank Securities Corporation, the roster of its personnel has been announced. In addition to T. E. Mitten, president, and Mr. Myers, other officers of Mitten Bank Securities Corporation are: A. A. Mitten, vice-president; A. A. Chapman, secretary and treasurer; C. E. Ebert, comptroller; D. E. Brown, assistant treasurer. The board of directors is composed of T. E. Mitten, chairman; A. A. Mitten, vice-chairman; W. K. Myers, J. F. Schmunk, Mitten Management's accounting officer; R. T. Senter, A. A. Chapman, S. H. Stout, L. W. Hackett, J. F. Shivers, J. E. Wood, L. R. Skeen, E. H. Naudascher and W. R. Smith. The seven last named are elected representatives of P.R.T. employees.

H. W. Ross has been promoted by the Missouri Public Service Commission from assistant accountant to chief accountant. He succeeds T. J. Murphy, who resigned after thirteen years service with the commission to become connected with the Inland Power & Light Company, St. Louis. Mr. Ross has been assistant to Mr. Murphy for the past four years and prior to that was in the accounting department of the Interstate Commerce Commission.

A. J. Smuts, who has been in charge of the gas properties of the Wisconsin Traction, Light, Heat & Power Company in Neenah and Menasha for the past several years, will also have charge of the transportation properties.

W. H. Henby of University City, Mo., was elected president of the Missouri Association of Public Utilities at its annual meeting in Cape Girardeau, Mo., on May 7.

Charles W. Milner, of the law firm of Humphrey, Middleton & Humphrey, has been appointed assistant general counsel of the Louisville Railway, Louisville, Ky.

Ezra B. Whitman, formerly chairman of the Maryland Public Service Commission and now a member of the commission, has been reappointed to that body by Gov. Albert C. Ritchie.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Aluminum Car Body Material Shipped to Chicago & Joliet

The Chicago & Joliet Electric Railway, Joliet, Ill., announces the first shipment of aluminum materials for the cars that were to be constructed on the new worm-drive trucks, a detail description of which appeared in the JOURNAL for May 28. Shipment was made from Pittsburgh on June 1 and the balance of the material is expected this week.

"If nothing unforeseen happens," writes J. R. Blackhall, vice-president of the company, "we should have the body ready about Aug. 15, meantime the trucks are in daily operation, having operated about 2,000 miles without the development of trouble of any kind. The motors are performing satisfactorily, notwithstanding the fact that the car body on the trucks weighs about 8,000 lb. more than the new body will weigh."

Haskelite Extensively Used in Lindbergh Airplane

Haskelite plywood, used extensively in the aircraft field and well known in the automobile, truck, marine, bus, electric railway and sign industries, has added a new record to its string. In addition to being used in the Curtiss NC transatlantic planes in 1919, the Douglas world cruisers in 1924 and four Loening good-will planes just returned from South America, it has the honor of forming a considerable part of the structure of the Ryan monoplane used by Captain Lindbergh in his New York-Paris flight.

In the "Spirit of St. Louis" haskelite forms the entire wing structure and the leading edges and is used for almost the entire cabin, as well as other parts of the ship.

Essentials of Modern Car Discussed in National Pneumatic Book

What is an exceptional piece of publicity and at the same time a distinct contribution to the movement for new, or rehabilitated cars is to be found in "The Modern Car," a booklet recently released by the National Pneumatic Company, New York City. In a concise and highly illuminating text the modern car is discussed in its essentials.

First, one reads this splendid conception of the modern car:

> The modern car is one which earns a maximum return on its investment. It is not necessarily a new car. All new cars are by no means modern. Neither are all old cars perfectly obsolete. The modern car, in other words, may be either new or reconstructed, but it must be so constructed and equipped in other parts that it will add in return the highest monetary yield.
>
> It is not enough, for instance, to equip the car with a modern motor if a modern braking system is not simultaneously included. It is not enough to furnish comfortable seats if no simple consideration is given to the heating, light and ventilation. Nor is it sufficient if small wheels and a low floor are specified but no other provisions made for the safe and rapid interchange of passengers.
>
> In all such cases as partial improvement —where improvements can be totally or even partially offset by disadvantages— there is really no forward step. There is no gain in speed, for instance, if fast operation is canceled by slow retardation or delay in handling passengers. The car, in other words, must be completely modern, or it is not truly modern.
>
> New or rehabilitated, therefore, we define the modern car as a car constructed or rebuilt to include and properly combine all modern features of construction so as to derive the greatest benefit from all, when this benefit is measured in net revenue.

The booklet is effectively illustrated. It will be an interesting adjunct to the library of any one interested in the development of modern transportation.

Conference Recommends Remedies

Committee on Industry Summarizes Economic Situations—Pools and Cartels Finalized

BY EDWARD J. MEHREN
Vice-President McGraw-Hill Publishing Company, Inc.

CLOSING its session on May 23 after three weeks of continuous work, the International Economic Conference meeting at Geneva adopted a long series of recommendations on commercial and agricultural topics and three on industrial subjects. How speedily the recommendations can be translated into action, where definite action is proposed, cannot be foretold. Immediate results must not be expected. The issues would require much time even if only national action were required, but there are various agencies for forwarding the work, such as the economic section of the League of Nations, the International Chamber of Commerce, the International Institute of Agriculture, the International Management Institute, etc.

Not all the economic ills of the world were surveyed at Geneva. The pressing question of the disposal of surplus populations was not touched, due to the fact that it is too political. No attention was paid—or practically none—to the economics of distribution, to the problem of decreasing the spread between manufacturing cost and ultimate selling price. To this problem we are devoting much time in the United States. But, as it was, the agenda was crowded and many topics set down received no attention.

CONFERENCE SUMMARY OF SITUATION

In cable messages and previous articles summaries have been given of the economic situation as presented to the conference and of the resolutions which have been adopted. There remains here chiefly to give more completely the resolutions on industrial pools and rationalization.

Before doing so, it is worth while to give the readers of the ELECTRIC RAILWAY JOURNAL an opportunity of reading the conference's own summary of the economic situation, as set forth in the preambles of the report of the committee on industry.

Said the committee on industry:

> The chief difficulties now experienced result from the facts that in certain countries sufficient capital has not been available or that, with existing restrictions and under present conditions, the available markets are inadequate for the productive capacity in a number of the principal industries. This maladjustment results from many causes and takes various forms. There is a maldistribution of plant and equipment. In those countries which participated actively in the war, plant capacity in many industries was increased for military purposes beyond the scale of what is required in peace; in other countries, new plants were installed to produce goods which could not be imported during the war, and the experience of war deprivations has developed a desire on the part of a number of nations to make themselves self-sufficing. Moreover, the general impoverishment of Europe immediately after the war lessened savings and handicapped industry by reducing at once the purchasing power of its clientele and the possibility of financial assistance from European money markets.
>
> Other causes have tended to a new distribution of manufacturing equipment; certain discoveries, for instance, have brought about a change in the use of raw materials or in the utilization of sources of energy and a displacement of industrial centers. The normal development of certain repair and finishing industries in partially industrialized non-European countries and the effort in Europe itself on the part of certain nations with rapidly growing populations to increase their industrial equipment with a view to providing work for an ever-increasing number of individuals have operated in a like direction.
>
> The war indirectly increased the influence of these causes of instability. It increased the desire of various nations to work up in their own territories the raw materials they produced; it augmented the number and the magnitude of the obstacles placed in the way of the movement of goods by tariffs and prohibitions and of the movement of persons by immigration laws, by passport regulations and by restrictions on the right of establishment in the case of foreigners. Finally, the changes made in the structure of the economic organism as a result of alterations in frontiers, the laborious readjustment of international relations and the insecurity of the financial and monetary situation have further retarded or impeded the efforts by which the European nations have endeavored to restore order in their industrial economic life.
>
> Of these causes, some are no longer operative, though their effects may last after them. The danger of great immediate additions to equipment in industries where plant capacity is already excessive is slight in the principal industrial countries; the will to save is being revived and the supply of capital grows steadily; exchange fluctuations are now confined to a few currencies and within much narrower limits than heretofore.
>
> Other causes—which were noticeable before the war—particularly the growth of industries in hitherto only partially industrialized countries, etc., must be considered as permanent and in the new world situation susceptive of direction only within very restricted limits.
>
> It is on a third category of factors that the conference has had to concentrate its attention, namely, those which by their nature can, in existing circumstances, be appropriately modified. Of these the most important are the restrictions and control

of the movement of goods and persons and, above all, those which result from tariff and commercial policy.

Finally, owing to the growing facilities for transport and the constantly increasing number of raw materials required for industrial production, the natural development of industry is toward greater international intercourse and larger international enterprises.

In next week's issue will be carried Mr. Mehren's summation of the resolution on industrial pools and rationalization adopted by the conference.

Heavy Sales of Lead at Better Prices

Not in months has the lead market been so active as during the last week, practically all producers reporting an unusual demand. Total sales of zinc, too, have been unusually large, and prices have advanced another 17½ points. Prompt tin advanced a little, with reasonably good demand. Copper sales have not amounted to anything all week, but prices have held firm; in fact, being slightly higher now than a week ago. A little copper was sold at 12⅝ cents, delivered, June 2, but since then the level has been 12½ cents, with 12⅞ cents and as high as 13 cents secured in the Middle West. Sales of zinc in the week ended June 8 have been the best in many weeks, June 2 being an especially active day. The London market has advanced proportionately the same amount as has the St. Louis market in the last two weeks. Spot lots of high-grade are nominally unchanged at 8 cents per pound.

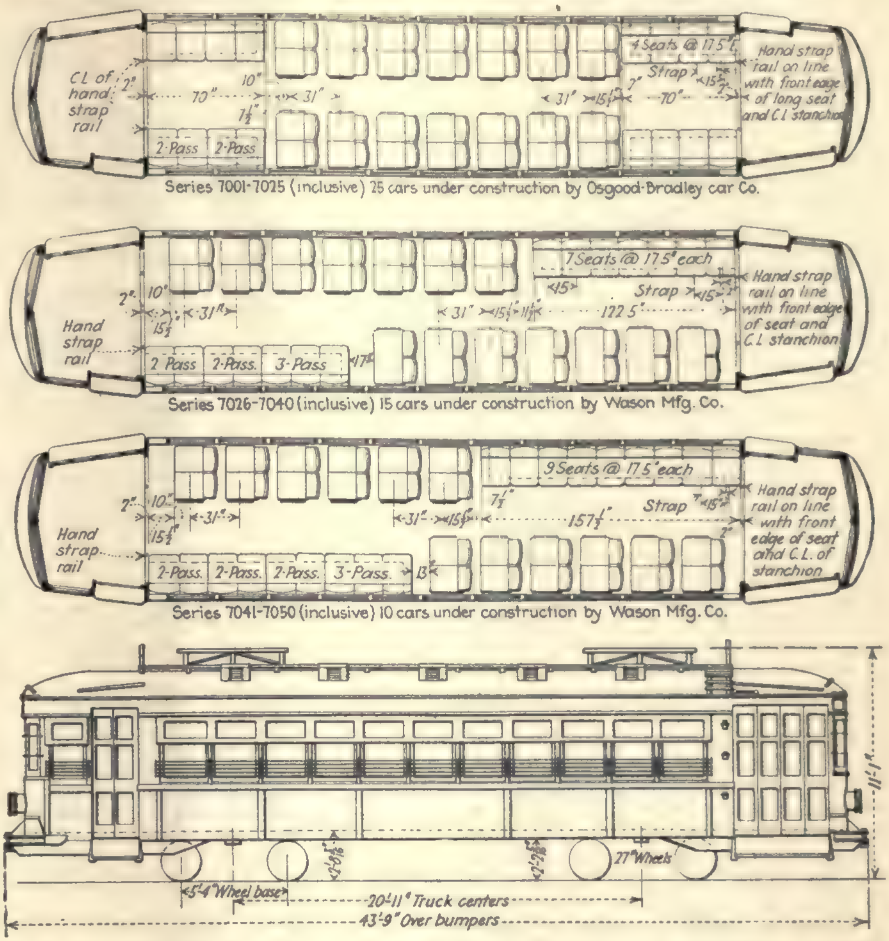
The domestic lead market suddenly and rather unexpectedly came to life late on June 1. The American Smelting & Refining Company has not increased its official contract price in New York from 6.40 cents, even though most of the business was done at 6.45 cents and 6.50 cents. The most active buying took place in the Middle West.

The tin market has been comparatively quiet, with prices steady, because of the limited supply of prompt metal on hand. This applies especially to Straits, which commands a premium of about 4 cents over 99 per cent; likewise, the prompt position enjoys an advantage of 3½ cents to 3¾ cents over futures.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	June 7, 1927
Copper, electrolytic, cents per lb.	12.52
Copper wire, cents per lb.	15.125
Lead, cents per lb.	6.42
Zinc, cents per lb.	6.62
Tin, Straits, cents per lb.	68.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.50
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.65
Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.60

Delivery Progressing on Eastern Massachusetts De Luxe Cars



Series 7001-7025 (inclusive) 25 cars under construction by Osgood-Bradley car Co.

Series 7026-7040 (inclusive) 15 cars under construction by Wason Mfg. Co.

Series 7041-7050 (inclusive) 10 cars under construction by Wason Mfg. Co.

Patrons of the Eastern Massachusetts Street Railway will shortly be served by these de luxe semi-convertible units

Final specifications are available for the 50 de luxe semi-convertible, semi-steel cars ordered by The Eastern Massachusetts Street Railway, Chelsea, Mass., on Jan. 5, as noted in ELECTRIC RAILWAY JOURNAL for Jan. 29. The order was equally divided between the Osgood-Bradley Company, Worcester, Mass., and the Wason Manufacturing Company, Springfield, Mass. Each car has a seating capacity of 44 persons, and, as will be noted from the accompanying plans, there is a diversity in the seating arrangement not only between the Wason and Osgood-Bradley units but also in the cars constructed by the former company. Delivery has already commenced and is scheduled for completion on June 15. The details follow:

Number of cars ordered	50
Name of road	Eastern Mass. St. Ry.
Date order was placed	Jan. 5, 1927
Dated of delivery	Starting May 15, 1927; complete, June 15, 1927
Builder of car body	25 Osgood-Bradley Co., 25 Wason Mfg. Co.
Type of car	Semi-convertible passenger
Seating capacity	44
Weight, total (estimated)	35,000 lb.
Bolster centers, length	20 ft. 11 in.
Length over all	43 ft. 9 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 2$\frac{11}{16}$ in.
Height, rail to trolley base	11 ft. 1 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	25 cars Agasote; 25 cars Haskelite
Roof	Arched, ⅝ in. Douglas fir
Air brakes	Westinghouse SM-2, with safety features and variable load device
Armature bearings	Plain
Axles	Standard Steel Co. carbon steel, 3½ in. x 6 in.
Bumpers	Hedley anti-climber
Car signal system	Faraday high voltage
Car trimmings	Statuary bronze
Center and side bearings	Brill
Conduits and junction boxes	Duratube and flexible metal conduit
Control	K-35KK, with hand switch
Destination signs	Hunter illuminated destination, side and front
Door operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Fenders or wheelguards	Brill
Gears and pinions	General Electric grade M, long and short addendum
Hand brakes	Peacock-National Brake Co.
Heater equipment	24-600-watt Consolidated Electric Service
Headlights	12 in. Golden Glow with fixed focus
Journal bearings	Two cars equipped with Timken roller
Journal boxes	Brill
Lamp fixtures	Dome fixtures, compensated
Lightning arresters	Westinghouse MP
Motors	Four GE-265
Motors	Inside hung
Paint	Pratt & Lambert Vitralite enamel
Registers	International
Sanders	Osgood-Bradley traps, Westinghouse Type "C" sander valves
Sash fixtures	Osgood-Bradley and Wason
Seats	Heywood-Wakefield 327M with deep cushions and divided backs
Seating material	Brown machine-buffed leather
Slack adjuster	American J-1
Springs	Brill
Step treads	Mason safety treads—Feralun
Trolley catchers	Wilson T-2
Trolley base	Nuttall US-20, roller bearing
Trolley wheels	Ideal, No. 40-A
Trucks	Brill 177-E-1-X
Ventilators	Utility New Era
Wheels	Bethlehem Steel 27 in. rolled steel
Special devices, etc.	¼ in. battleship linoleum flooring; dome lighting fixtures; cabinets inclosing platform piping, etc.
Power-saving device	Economy meters with inspection dials

Municipal Railway Splits $20,000 Trolley Wire Bid

Municipal Railway, San Francisco, Cal., received on June 2 bids on trolley wire to be used for the construction of the Judah Street extension of its lines. The Pacific States Electric Company and American Brass Company were the lowest bidders for the $20,000 contract. President Timothy A. Riordan stated that awards will probably be divided between the two concerns.

Mr. Riordan announced that within the next few weeks bids will be received for the trolley poles for the new Judah Street line, and also for the laying of ties. The ties have already been purchased.

"Miller Medal" Donated by Welding Society

The American Welding Society, through its president, F. M. Farmer, announces the donation of an award, the gift of Samuel Wylie Miller, to be presented by the society annually in appreciation of work of outstanding merit in advancing the art and science of welding. The award is a gold medal, which will be known as the Miller medal.

The donor has been one of the outstanding figures in the advancement of welding ever since its commercial inception. He is a past-president of the American Welding Society and a prominent and active member of the Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers and other scientific and engineering organizations. Mr. Miller is consulting engineer of the Union Carbide & Carbon Research Laboratories, Inc.

In establishing this award, Mr. Miller's object is to promote an appreciation of better welding and to encourage the study of those fundamentals which will lead to raising the quality of work done by the average operator.

Rolling Stock

The Terre Haute, Indianapolis and Eastern Traction Company, Indianapolis, Ind., has christened its latest interurban coach "Wiley High School." The car, which recently made a trial run from Terre Haute to Indianapolis and return, reveals a great improvement over other cars now in general service on the line. It was remodeled at the Terre Haute shops of the company. There are dome lights and special reading lamps for the seats. The seats are air-cushioned, non-reversible, covered with moiré plush. Mahogany finish and battleship lineoleum on the floors add to the general appearance of the car. The car has a maximum speed of 70 m.p.h., driven by four 100-hp. motors. It seats 51 persons.

A. E. R. A.

The Bidding is Brisk

85,909 sq.ft. of the de luxe show room space shown in the illustration below had been bid in on June 6 by 160 exhibitors, who were more willing to sign for than be assigned space at the big exhibit. This represents 26 more exhibitors and a 20,718-sq.ft. increase over the same date last year.

Virginia Electric & Power Company, Norfolk, Va., has placed ten new buses in operation in the Virginia seaside city, according to a recent announcement from the company's headquarters in Richmond. The new equipment is of the same type as that put in operation in Richmond in January.

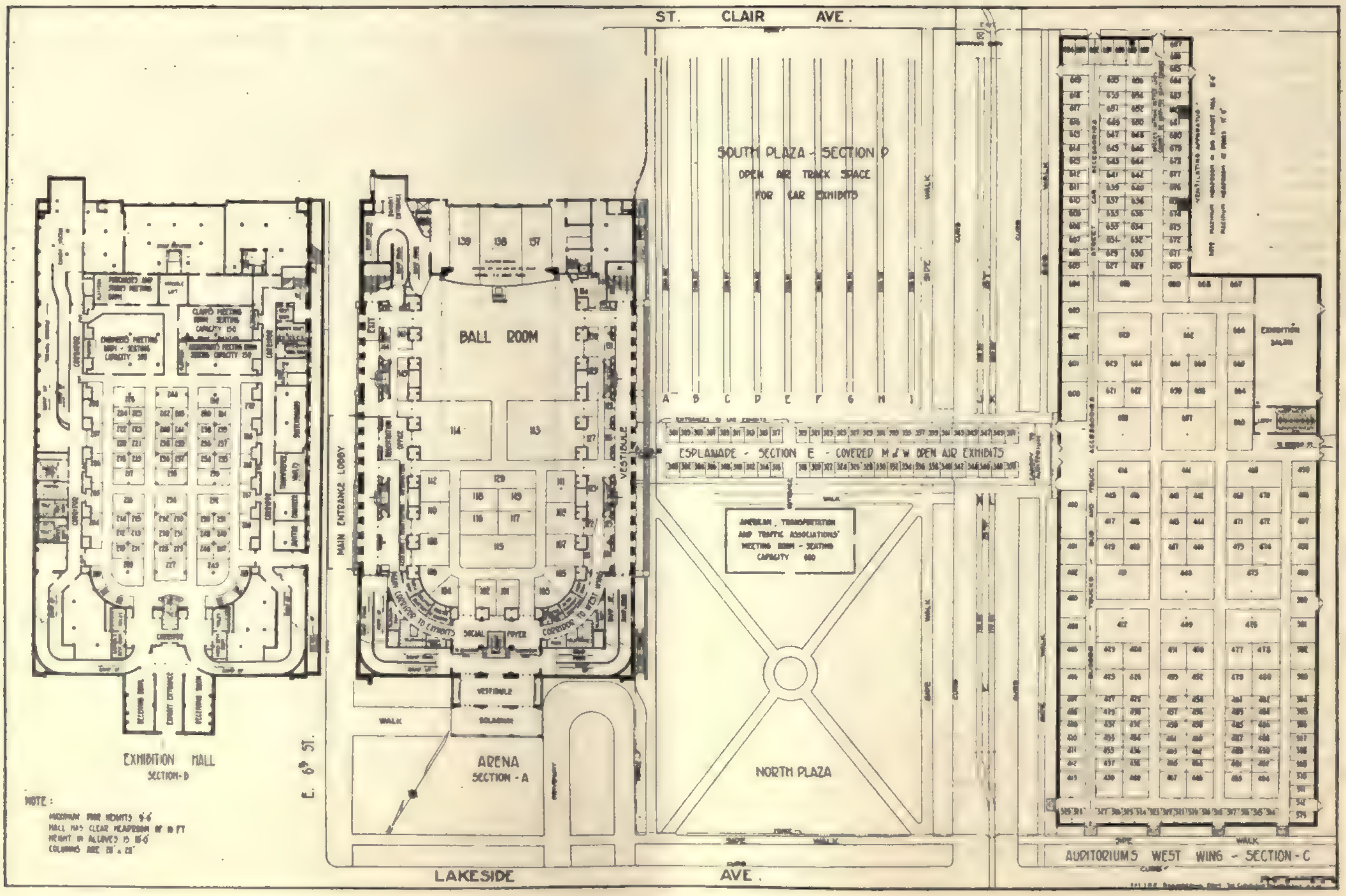
Public Service Transportation Company, Newark, N. J., bus operating subsidiary of the Public Service Railway, accepted delivery on sixteen Mack 29-passenger city type buses, six-cylinder motor, 233-in. wheelbase. These are a part of the original order for 147 buses.

Iowa Southern Utilities Company, Centerville, Iowa, has received from the Allentown factory of the International Motor Company two city type Mack four-cylinder buses, 25-passenger capacity.

Pittsburgh Motor Coach Company, Pittsburgh, Pa., has bought six Yellow buses. These are type X, 17-passenger parlor cars.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has purchased three Yellow buses. Two of these are 29-passenger city type and the third is a parlor car.

Wisconsin Public Service Company, Madison, Wis., has purchased four 21-passenger street car type Yellows.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OPEN AIR TRACK SPACE FOR CAR EXHIBITS
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"Peacock"
Reg. U. S. Pat. Office
STAFFLESS BRAKES

"Peacock"
Reg. U. S. Pat. Office
STAFFLESS BRAKES

Every Time Babe Ruth

poles out a home run fans from Seattle to Sag Harbor proclaim the mighty Bambino. He deserves it. But he does not make good every time he comes to bat.

Peacock Staffless Brakes are pinch hitters. The motorman sends them in to bat out a home run when two men are down in the last half of the ninth inning—when a safe drive means the difference between a win and disaster.

The fact that they are on most of the modern cars today means something. Write us for the record of Peacock Staffless Brakes as pinch hitters.

NATIONAL
BRAKE CO., Inc.
890 Ellicott Sq., Buffalo
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Canadian Representative
Lyman Tube & Supply Co., Ltd., Montreal, Can

One of the Goodyear-equipped fleet of the California Transit Company, Oakland, California

GOODYEAR

Copyright 1927, by The Goodyear Tire & Rubber Co., Inc.

Uninterrupted Service

Every successful bus operator knows that one of the most important factors in bus operation is uninterrupted service.

Buses must run on schedule if public confidence is to be maintained.

And that is one reason why more pneumatic-equipped buses run on Goodyear Bus Tires than on any other kind.

* * *

Other bus tires can be bought as cheaply, and sometimes cheaper than Goodyears.

But a slight saving in first cost on tires may frequently be lost many times over in interrupted revenue due to tire failures and changes en route.

Goodyear Pneumatic Cord Bus Tires have a great record for sustaining schedules, largely because they are made with SUPERTWIST—the new cord material which eliminates shoulder breaks and other casing troubles.

This patented cord fabric was invented and developed by Goodyear to overcome carcass failures and diminish tire changes.

* * *

It is more elastic than ordinary cord fabric.

It stretches farther before it breaks.

It withstands flexing better and longer before "fabric fatigue" sets in.

SUPERTWIST, therefore, makes a more durable and more trouble-proof tire.

It reduces the frequency of tire changes and so helps to maintain schedules and increases operating revenue.

* * *

This is one of the reasons why all the buses of the California Transit Company, for example, are equipped with Goodyear Pneumatic Cord Bus Tires.

"In a service such as ours," writes Mr. W. E. Travis, President of the California Transit Company, "uninterrupted transportation is of major importance, and tires play a most important part in helping our buses maintain numerous extremely difficult schedules.

"Our franchise covers routes through the interior of California, connecting Sacramento and Napa in the North, and intermediate cities with Los Angeles in the South.

"In serving this territory our 138 buses travel over 600,000 miles a month, and in that period carry over 100,000 passengers.

"Considering that our routes cover long runs over mountainous and desert country, where in the summer the heat is intense, tires must be more than good before we will consider using them.

"We rarely endorse products, but we have been using Goodyear tires on all our buses for the past year, and are more than satisfied with the results, as well as our relations with your company."

For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service

BUS TIRES

Made with SUPERTWIST

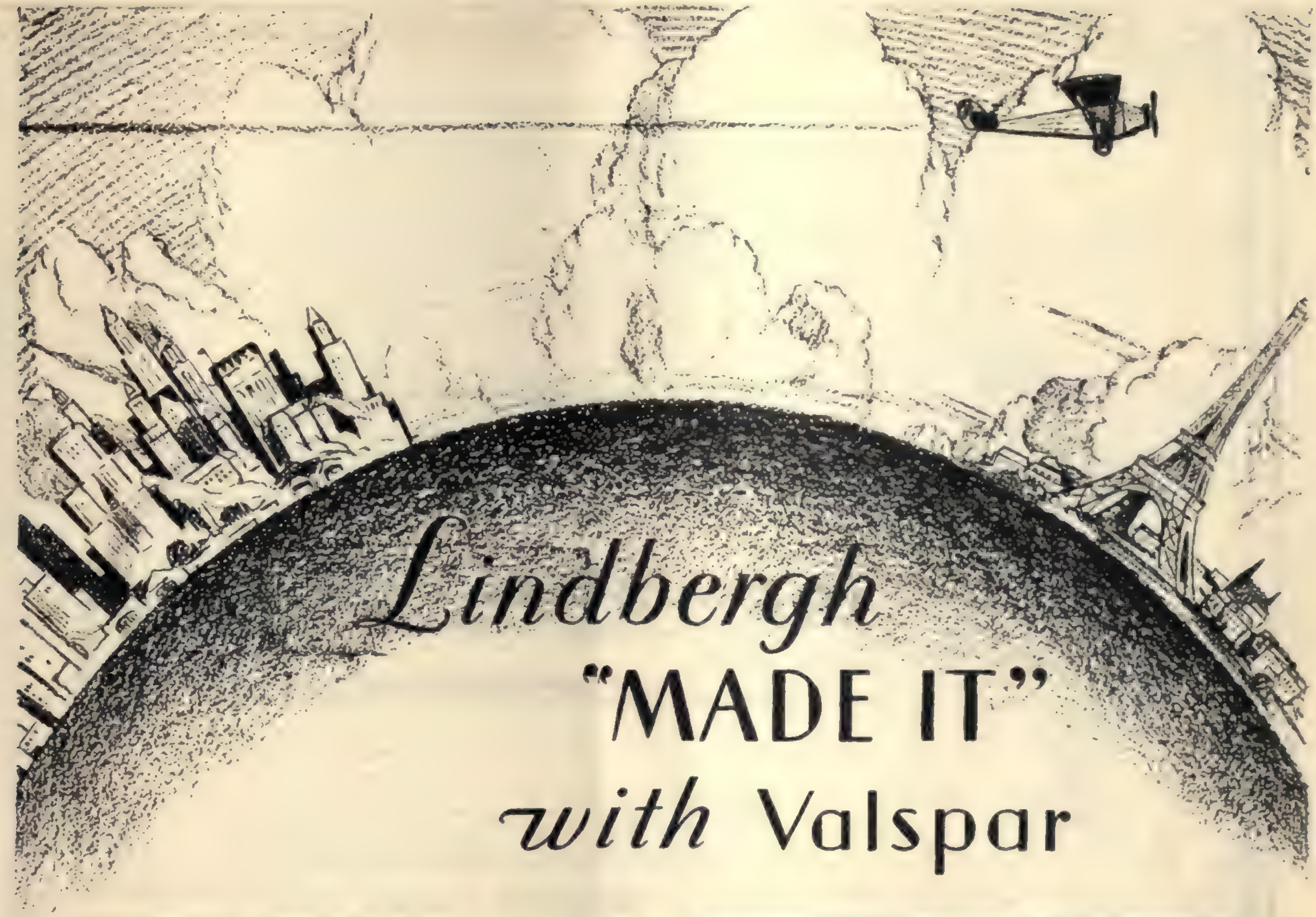
Hope.. or History?

YOU can buy a wheel that *seems* right—a wheel that looks good in the showroom—but has never been through the mill of road experience to prove that it *is* as good as it looks. You can buy it—on hope.

Or you can buy Budd-Michelin—a wheel that for twelve years has met every road problem a wheel must meet. A wheel that is keeping 100,000 buses and trucks on the road—that has been with the bus industry from the beginning. A wheel you can bank on, that you can buy *safely*—on history.

Which way will you buy?

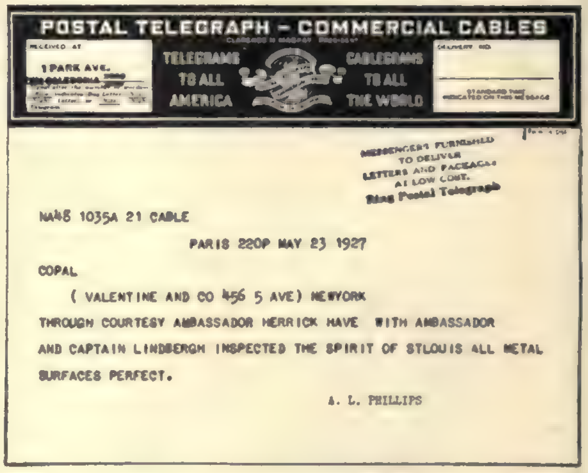
BUDD
WHEEL COMPANY
Detroit



CAPTAIN LINDBERGH'S epoch-making flight from New York to Paris, which captured the imagination of the world, was made in a Valsparred plane. Mr. Mahoney, President of the Ryan Air-Lines, Inc., writes:—

> **"In the construction of the Trans-Atlantic ship for Captain Lindbergh, we used Nitro-Valspar on all of the metal parts and steel tubes throughout. We find it to be far superior to any other lacquer which we have used.**
>
> **"Valspar was used on all internal wood structure and all other wood parts of this New York to Paris ship."**

Valspar has protected practically every famous record-breaking plane.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THROUGH COURTESY AMBASSADOR HERRICK HAVE WITH AMBASSADOR AND CAPTAIN LINDBERGH INSPECTED THE SPIRIT OF STLOUIS ALL METAL SURFACES PERFECT.

A. L. PHILLIPS

This is the cablegram received from Mr. Phillips who inspected Captain Lindbergh's plane with Ambassador Herrick in Paris.

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The Valentine Lacquer Finish

VALENTINE & COMPANY
Largest Manufacturers of High-Grade Varnishes in the World—Established 1832
New York Chicago Boston Toronto London Paris Amsterdam
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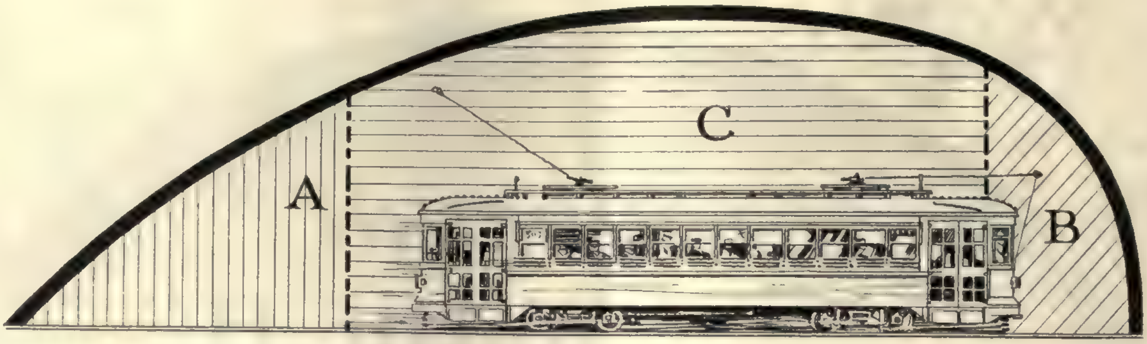

THE speed time curve tells the story. Quick starts and quick stops increase the average speed. Area **A** has been reduced by improvements of power. Area **B** has been decreased by improvements in braking apparatus and brake shoes. Area **C** has increased as a result of decrease in Area **A** and **B.** The use of Diamond S shoes will increase the average train speed.

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101 YEARS OF MANUFACTURING EXPERIENCE

Cane Webbing may be ordered through any H-W sales office.

Interior of one of the Eastern Mass. Street Railway cars, showing the installation of our No. 327-M.

A MODERN CAR SEAT!

THE Eastern Massachusetts Street Railway was in the market for a modern car seat that would increase the attractiveness and comfort of its cars. It finally selected our 327-M—the new, fast-selling Heywood-Wakefield design shown above.

This seat has deep, double spring cushions. Mechanism rails are set in. The individual backs are properly pitched for comfort.

Our car seating experts will be glad to help you decide on the best seating equipment for your needs. This service is free through any H-W sales office.

We shall be glad to send you complete information on this practical seat, as well as a copy of our new Bus Seat Catalogue.

Heywood-Wakefield
REG. U.S. PAT. OFF.

Heywood-Wakefield Co., Wakefield, Mass.; 516 West 34th St., New York, N. Y.; 439 Railway Exchange Bldg., Chicago, Ill. H. G. Cook, Hobart Bldg., San Francisco, Cal. The G. F. Cotter Supply Co., Houston, Texas. F. N. Grigg, 630 Louisiana Ave., Washington, D. C. The Railway & Power Engineering Corp., 133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada.

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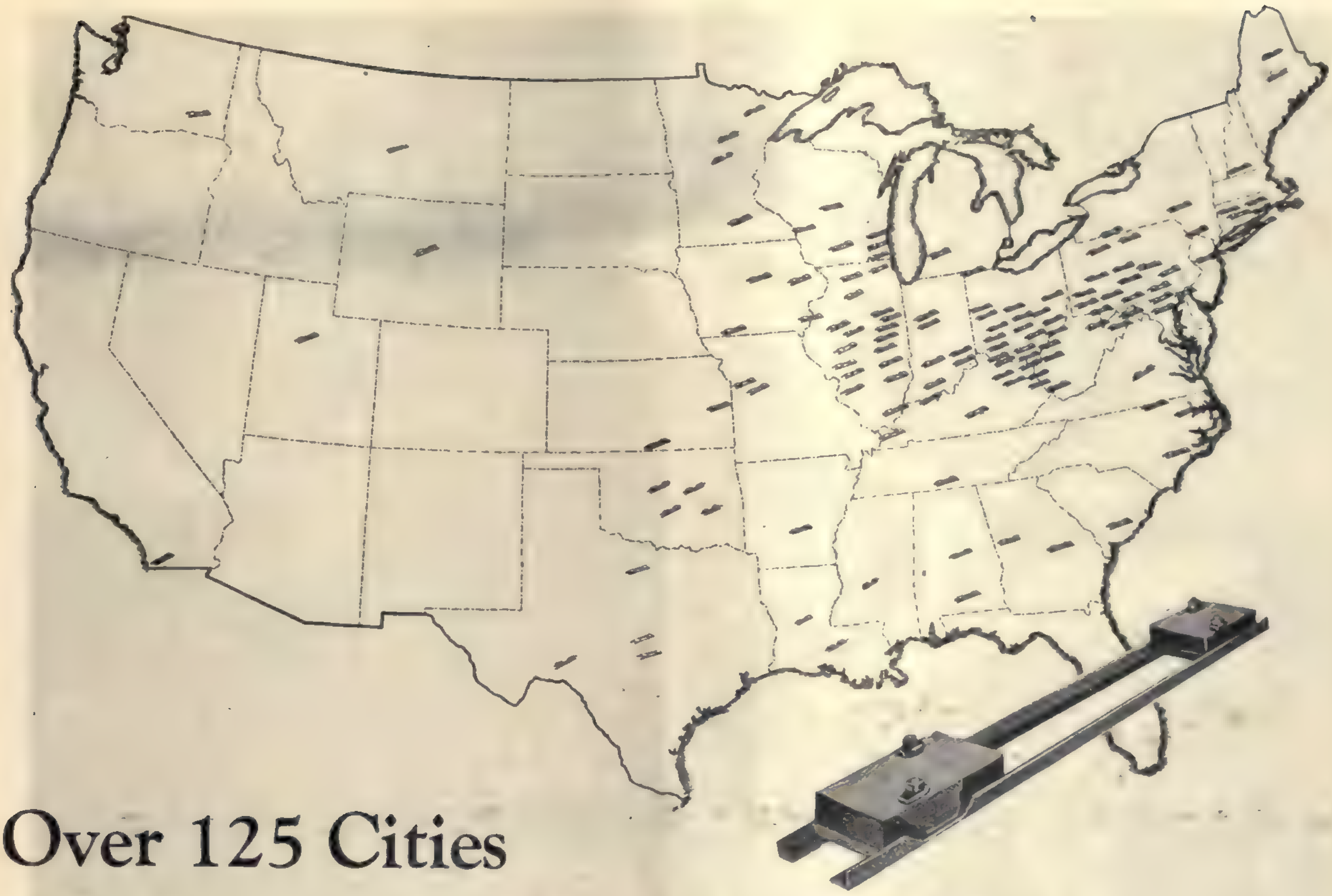
THE PAVEMENT THAT OUTLASTS THE BONDS

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION, ENGINEERS BLDG., CLEVELAND, OHIO



Over 125 Cities

One to Ten Installations Each—

Not One Failure

In the past fifteen years, over 125 cities in the United States have each put in one to ten installations of Dayton Ties.

Some of these installations were under steam road crossings. Many were under the heaviest traffic the industry has to offer. Widely scattered, they had to meet every possible climatic condition.

Of all that vast mileage of track, not one foot has failed.—More than that, not one penny has been spent on maintenance for any of it.

Why—because the combination of Dayton Ties, and the concrete foundation produces that which the Electric Railway Industry has sought for years—lastingly smooth track. Dayton Ties, by their inherent construction, completely absorbs the vibration which otherwise crumbles the concrete. Wherever Dayton Tie Track has been opened, the concrete, tie, and rail have been found in perfect condition, no matter how long it has been down.

Dayton Tie Track is not only economical to use—it is also economical to lay. Many engineers have surprised themselves and their companies by the low cost per foot at which they have been able to lay Dayton Track.

These 125 cities are well distributed throughout the United States.

Let us tell you where there is one near you.
See it, and talk with the engineer in charge.

The Dayton Mechanical Tie Co.

DAYTON, OHIO

Foster sells at a PRICE which consistently gets the order. All materials shipped subject to Inspection and Approval at Destination and GUARANTEED. Unequalled warehouse, storage yard, and fabricating facilities assure prompt, satisfactory SERVICE.

Get in touch with FOSTER before placing your next order.

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MASSACHUSETTS MOHAIR PLUSH

The railroad standard for over 35 years

The Massachusetts Mohair Plush Mills

Just so that you may know what sort of a plant we have!

After all's said and done it is important to know the facilities of the concern you buy materials from. Quantity production gives you the best at a competitive price. Efficient production and plenty of "overload" capacity assures your getting your order through on schedule.

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The Mill in 1900

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

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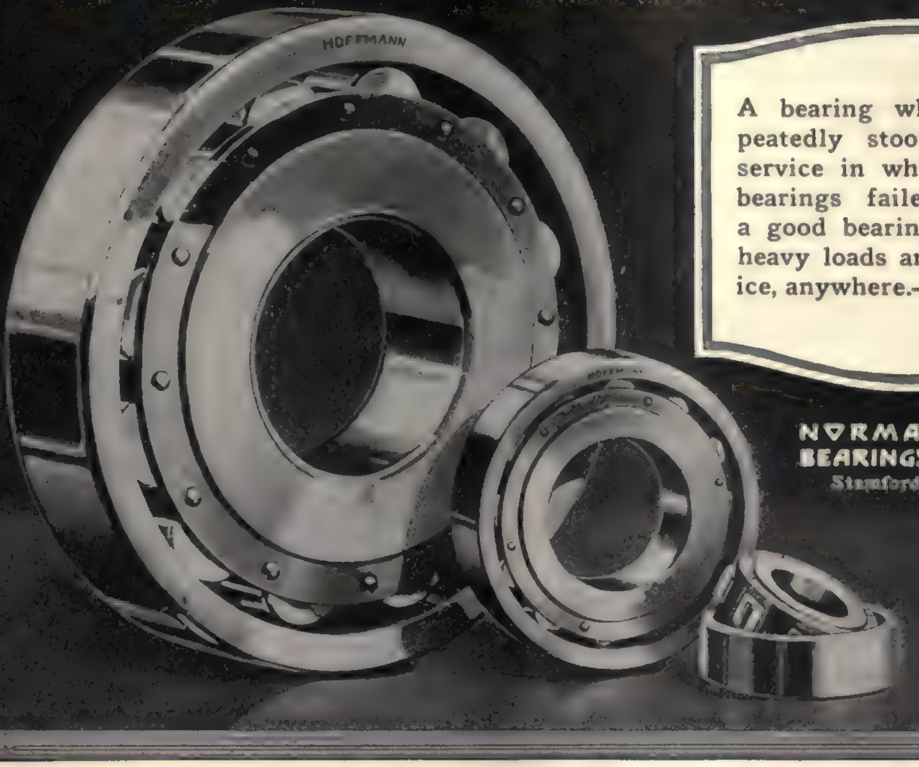

A bearing which has repeatedly stood up under service in which all other bearings failed—therefore, a good bearing to use for heavy loads and hard service, anywhere.—Catalog 904.

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US 20-A Trolley Base with Timken Bearings

Up to the Minute

New, modern cars deserve a modern trolley base. That is why we designed and built the US 20-A base.

The US20-A is the outcome of forty years' experience in building trolley bases. Double race, Timken roller bearings make the base free swivelling, permitting the trolley to readily follow the variations of the trolley wire; large grease reservoirs make it necessary to lubricate the base only at six month intervals; and large capacity shunts carry the current around the roller bearings and the axle pin.

The popularity of the base among operating men is attested by the fact that there are hundreds of them in service on electric lines in the United States.

Send for our bulletin No. 46

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insure a permanent, repair-free track. Temperature variations, water or decay will not affect it. ℭ Steel Cross Ties are now being used in practically all new work where economy and permanency are the chief considerations. ℭ If you are interested in "low-maintenance-cost" track, send for a copy of our booklet—Steel Cross Ties.

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18"

BUFFALO
Hand-Holds—

are a necessity! Without them great difficulty is experienced by passengers attempting to walk through cars. They create better public relations!

They will not stain the hands, and the riding public, which shuns anything soiled, is pleased with this feature. This also helps to improve good will!

And they are moderately priced. *Investigate.*

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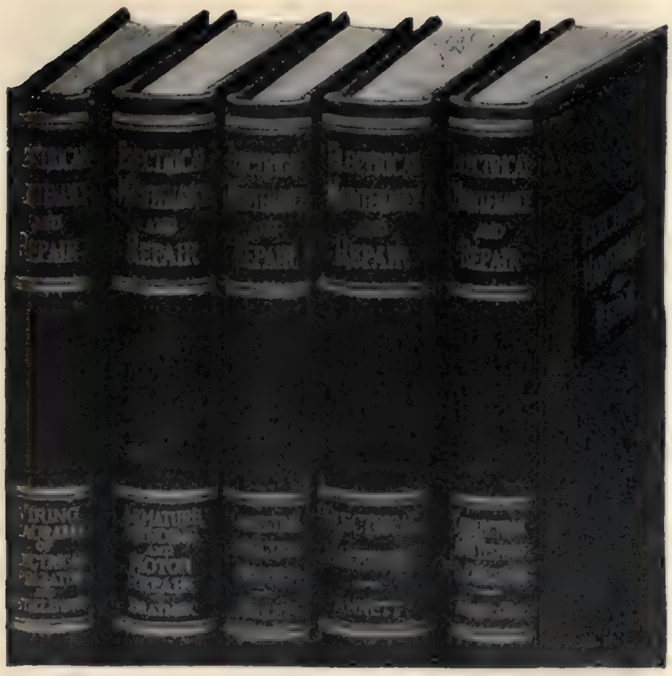

5 Big Helps

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New Form

The Library of Electrical Maintenance and Repair—in its new form—contains Annett & Roe's CONNECTING AND TESTING D.C. MACHINES and the new second edition of Dudley's CONNECTING INDUCTION MOTORS.

1. The five books in this library discuss actual repair jobs and show you step by step what to do when anything goes wrong.
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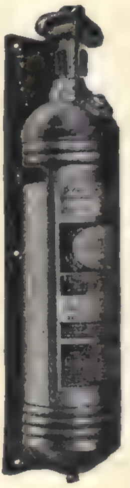
IMPROVED Pyrene FIRE EXTINGUISHER

TRADE MARK

Safety demands that every car or bus be equipped with a Pyrene Fire Extinguisher. The riding public expect and are entitled to the protection from fire which this extinguisher assures.

Aside from the protection from fire afforded by such installation, to both rolling stock, operator and passengers, the schedule of the Central Traction and Lighting Bureau specifies a charge of 5¢ on motor buses, 3¢ on interurban and 1¢ on urban cars, for the absence of fire extinguishers.



The slight outlay involved by having rolling stock equipped with an Improved Pyrene (one-quart) Fire Extinguisher should be regarded as an investment—a device that helps make safety from fire certain should be popular.

Safety adds to the revenue of the operating company by inspiring confidence in the riding public toward modern transportation.

Many of the leading Public Service Corporations recognize this and have equipped their cars and buses with Pyrene Fire Extinguishers—they know a burning car or bus need not be abandoned if a Pyrene Fire Extinguisher is at hand.

For the protection of electrical equipment, power houses, car barns, shops and storerooms Pyrene (1½ quart) Fire Extinguishers are dependable in every emergency.

PYRENE MANUFACTURING CO.
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We make a specialty of
ELECTRIC RAILWAY
LUBRICATION
We solicit a test of TULC
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Special Track Work of every
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SUPERINTENDENT of track—On a property in the eastern section of the United States having somewhat over 275 miles of track, largely in paved highways; includes also some tee rail on a high speed line; only an experienced, aggressive, capable man will be considered; in reply describe education and extent of practical experience received and state salary expected; references required; replies will be held strictly confidential. P-12, Electric Railway Journal, Tenth Ave. at 36th St., New York.

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Representatives Wanted
Salesmen Wanted
Work Wanted
Etc., Etc., Etc.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Air Receivers & Aftercoolers
Ingersoll-Rand Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Automatic Regulator, Voltage, Current & Synchronizing
American Brown Boveri Elec. Corp.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

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Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
St. Louis Car Co.
Standard Steel Works
Westinghouse E. & M. Co.

Axles, Steel
Carnegie Steel Co.

Babbitting Devices
Columbia Machine Works & M. I. Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Bankers and Engineers
Public Service Engineering Bureau

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Nichols-Lintern Co.

Bearings, Ball
Norma-Hoffman Bearing Co.

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Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
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Columbia Machine Works
Stucki Co., A.

Bearings, Roller
Norma-Hoffman Bearing Co.
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Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Brill Co.: The J. G.
Lang Body Co.
St. Louis Car Co.

Body Material, Haskelite and Plymetl
Haskelite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

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American Steel & Wire Co.
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Ohio Brass Co.
Railway Trackwork Co.
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Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

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Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

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Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.

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National Ry. Appliance Co.

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Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
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Brick, Vitrified
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Jeandron, W. J.
LeCarbone Co.
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Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
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Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

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Consolidated Car Heating Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
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Brill Co., The J. G.
St. Louis Car Co.

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Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Wason Mfg. Co.

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Electric Equipment Co.

Cars, Self-Propelled
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General Electric Co.

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Columbia Machine Works & M. I. Co.

Castings, Gray Iron and Steel
American Brake Shoe & Fdry. Co.
American Steel Foundries
Bemis Car Track Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Standard Steel Works

Castings, Malleable & Brass
American Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
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Ohio Brass Co.
Wood Co., Chas N.

Catenary Construction
Archbold-Brady Co.

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Electric Service Supplies Co.

Change Trays
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Westinghouse E. & M. Co.

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General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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Cincinnati Car Co.
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Consolidated Car Heating Co.
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Wm. Wharton, Jr. & Co.

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Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
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Standard Steel Works

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Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
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Ohio Brass Co.
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General Electric Co.
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Cincinnati Car Co.
St. Louis Car Co.

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(Continued on page 42)

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Ohio Brass Co.
St. Louis Car Co.

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Haskelite Mfg. Corp.

Heaters, Bus
Nichols-Lintern Co.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

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Cincinnati Car Co.
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(Continued on page 45)

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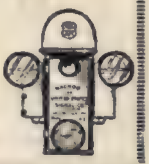

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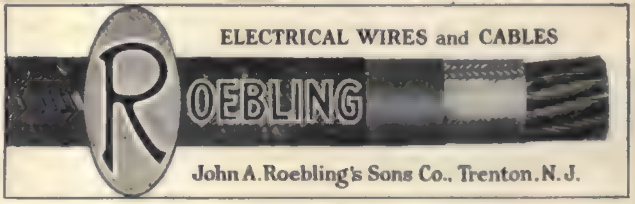

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Page

American Brake
Foundry Co.
American Brass
American Brow
Corp. .....
American Car
American Elec
American Stee
American Ste
Anaconda Cop
Archbold-Bra

B

Babcock & Wilcox Co.......... 37
Bates Expanded Steel Truss Co. 43
Beeler Organization 36
Bemis Car Truck Co........... 44
Bethlehem Steel Co............ 18
Brill Co., The J. G...........46-47
Buchanan & Layng Corp........ 36
Buda Co., The 38
Budd Wheel Co................ 24
Byllesby Engineering & Management Corp. 37

C

Cameron Electrical Mfg. Co.... 43
Carnegie Steel Co.............. 34
Central Equipment Co.......... 34
Chillingworth Mfg. Co......... 45
Cincinnati Car Co............14-15
Cleveland Fare Box Co......... 37
Collier, Inc., Barron G......... 32
Columbia Machine Works, The. 33
Consolidated Car Fender Co.... 44
Consolidated Car Heating Co.... 45

D

Day & Zimmermann, Inc........ 36
Dayton Mechanical Tie Co...... 29
Differential Steel Car Co., The.. 44

E

Electric Equipment Co......... 39
Electric Ry. Equipment Co.... 43
Electric Service Supplies Co.... 9

General Electric Co...........19-20
Goodyear Tire & Rubber Co..22-23
Gold Car Heating & Ltg. Co.... 44

H

Hale-Kilburn Co............... 37
Haskelite Mfg. Corp.....Back Cover
Heywood-Wakefield Co......... 27
"Help Wanted" Ads............ 39
Hemphill & Wells 36
Holst, Englehardt W........... 36
Hubbard & Co................ 44

I

Illinois Motive Equipment Co.. 37
Illinois Steel Co............... 16
Ingersoll-Rand Co. 41
International Register Co...... 38
International Steel Tie Co., The. 7
Irvington Varnish & Insulator Co. 37

J

Jackson, Walter 36
Jeandron, W. J............... 33

K

Kelker, DeLeuw & Co.......... 37
Kuhlman Car Co.............46-47

Massachussetts Mohair Plush Co. 31
McClellan & Junkersfeld 36
McGraw-Hill Book Co.......... 35

N

Nachod and U. S. Signal Co.... 43
National Brake Co., Inc....... 21
National Paving Brick Mfgrs. Association 28
National Pneumatic Co........ 13
National Ry. Appliance Co..... 37
Naugle Pole & Tie Co......... 44
Nichols-Lintern Co............ 44
Norma-Hoffman Bearings Corp. 33
Nuttall Co., R. D.............. 34

O

Ohio Brass Co................. 5
Okonite-Callender Cable Company, Inc., The.............. 43
Okonite Co., The.............. 43

P

Perey Mfg. Co., Inc........... 44
Positions Wanted and Vacant... 39
Public Service Engineering Bureau 36
Pyrene Mfg. Co............... 35

R

Railway Track-work Co....... 4
Railway Utility Co............ 44

p........... 43
.... 36
John A.... 43

.... 17
orks......... 43
er 36
ion 39
Co............... 43
Smith Heater Co., Peter...... 44
Standard Steel Works Co...... 38
Star Brass Works............ 44
Stevens & Wood, Inc.......... 36
Stone & Webster 36
Stucki Co., A................. 44

T

Timken Roller Bearing Co., Front Cover

U

Una Welding & Bonding Co.... 37
Universal Lubricating Co...... 38

V

Valentine & Company 25

W

"Want" Ads 39
Wason Mfg. Co.............46-47
Westinghouse Electric & Mfg. Co. 2
Westinghouse Traction Brake Co. 10
Wharton, Jr. & Co., Inc., Wm. 38
"What and Where to Buy," 40-42-45
Wish Service, The P. Edw..... 37
White Eng. Corp., The J. G.... 36
Wood Co., Chas. N............ 43

WHAT AND WHERE TO BUY—Continued from page 42

Trolley Material, Overhead
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Trolley Wheel Bushings
Star Brass Works

Trolley Wheels (See Wheels Trolley)

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Bemis Car T
Brill Co., T
Cincinnati C
St. Louis C

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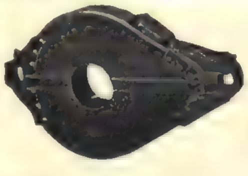

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One-Piece Gear Cases
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Best for Service — Durability and Economy. *Write Us.*
Chillingworth Mfg. Co.
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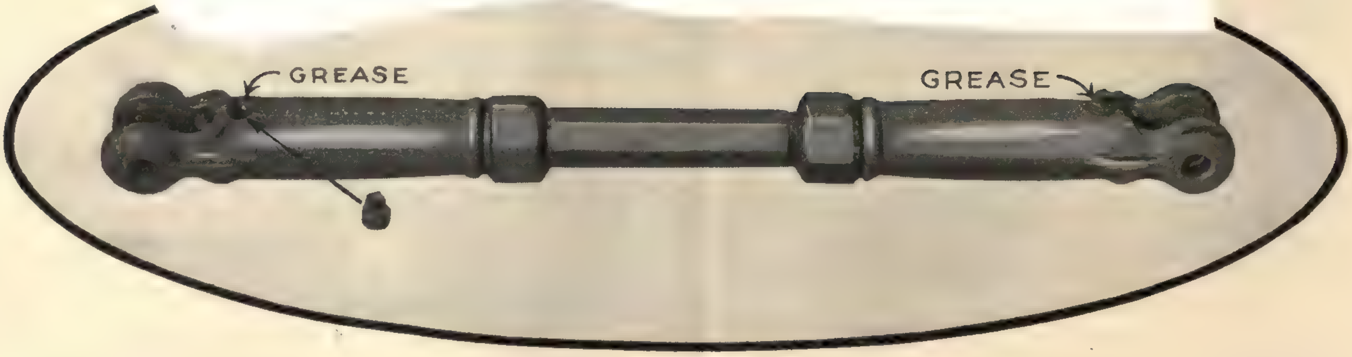

"Recommended by proven merit"

Easier Adjustment
with Lubricated Brake Rods

With the jaw castings at each end of the bottom brake rods closed, thus forming grease pockets, the threaded ends of the adjustable hex rod are protected at all times against the ravages of rust, and the adjustment at this point is easy.

While this detail may be considered of comparatively little importance, it reflects the Brill policy of maximum truck efficiency and contributes its part to the unusually low maintenance characteristic of Brill trucks.

Copy of Bulletin 306 mailed upon request

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MANF'G CO.
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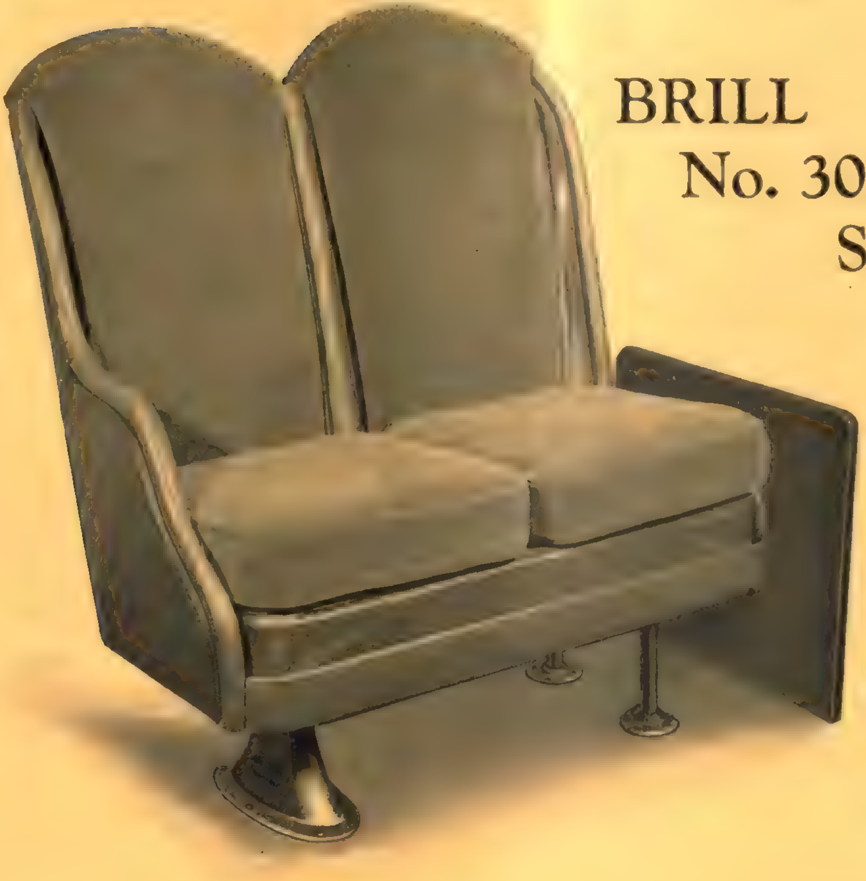

BRILL
No. 301
Seat

An Aid to Transportation Sales
Brill Seat Comfort

Increased passenger travel, the goal of every public transportation agency, depends in no small way upon the character of seat comfort provided. As an aid to transportation sales it occupies a unique position in both electric cars and buses.

Seats of Brill manufacture are not only designed to provide that necessary comfort, but also are substantially constructed to withstand the exacting requirements of public transportation service. The No. 301 type being non-reversible is adapted to single-end cars and buses. Upholstered in leather or both plush and leather, with loose cushions of both air and spring type mattress construction, it is most attractive and comfortable.

Copy of Catalog 284 mailed upon request

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MANF'G CO.
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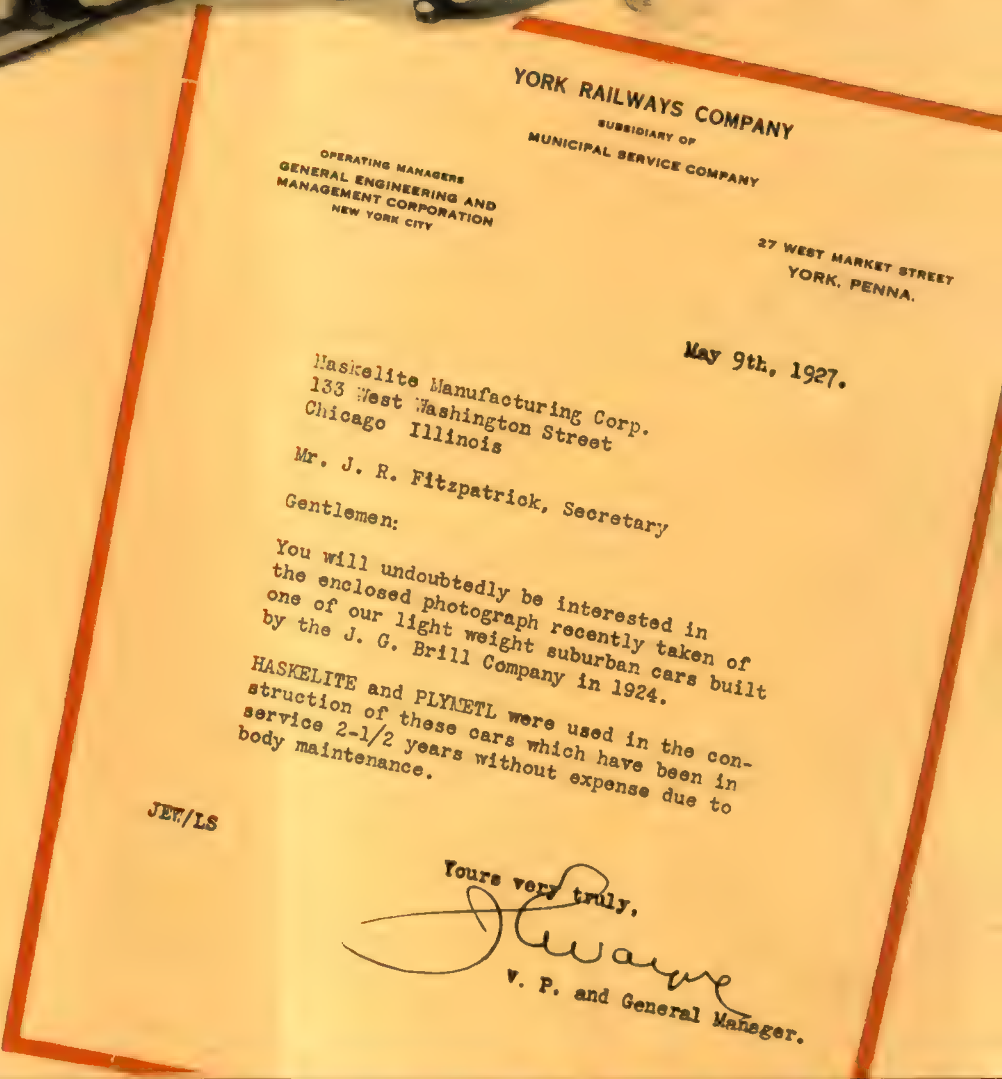
HASKELITE ROOFS



YORK RAILWAYS COMPANY
SUBSIDIARY OF
MUNICIPAL SERVICE COMPANY

OPERATING MANAGERS
GENERAL ENGINEERING AND
MANAGEMENT CORPORATION
NEW YORK CITY

27 WEST MARKET STREET
YORK, PENNA.

May 9th, 1927.

Haskelite Manufacturing Corp.
133 West Washington Street
Chicago Illinois

Mr. J. R. Fitzpatrick, Secretary

Gentlemen:

You will undoubtedly be interested in the enclosed photograph recently taken of one of our light weight suburban cars built by the J. G. Brill Company in 1924.

HASKELITE and PLYMETL were used in the construction of these cars which have been in service 2-1/2 years without expense due to body maintenance.

JEW/LS

Yours very truly,

J E Wayne

V. P. and General Manager.

The York Railways,
ork, Pennsylvania, put HASKELITE oofs and PLYMETL side panels in ervice 2½ years ago. Note the attached rom Mr. J. E. Wayne, Vice-President nd General Manager — "No body naintenance." Send for list of over 00 prominent users of HASKELITE, LYMETL, or both, and blue print ooklet of applications to street car and us construction.

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PLYWOOD
HASKELITE
PLYMETL

PLYMETL SIDE PANEL

MAINTENANCE AND CONSTRUCTION ISSUE

raw-Hill Publishing Company, Inc. June 18, 192 Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL

Time Tested Ties

Paved track construction that embodies steel twin ties is construction that defies time. There is no deterioration because of age or service. The rails are held permanently in place—and when the rails wear out new ones may be laid on the old foundation.

And of vital interest to railway executives, steel twin tie construction has proven lower in first cost, and lower over a period of years, on over 200 American Electric Railways.

We have a fund of data on paved track construction that is always at your service. The Paved Track Notebook analyzes the entire subject for you. Have you your copy and the 1927 delivered price on Twin Ties?

The International Steel Tie Co.
Cleveland, Ohio

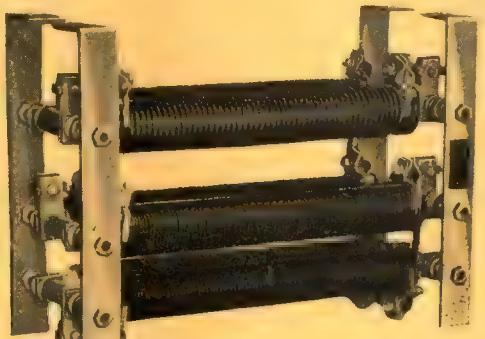
* *Look it up in your "Paved Track Note Book"*

Steel Twin Tie Track

Light!

weighs one-fourth

Light weight is of vital importance in the design and equipment of street railway cars. Your starting resistor represents an important proportion of the weight of the control equipment. Our type "M" resistor permits a reduction in weight for this item of approximately seventy-five per cent.



Type M Resistor

Strength is of equal importance with weight. The resistance element of our Type "M" Resistor is a drawn ribbon alloy wound spirally around porcelain insulators. This construction eliminates localized heating and evenly distributes any strain. The flexibility of the alloy prevents breakage in even the most extreme cases.

Durable!

non breaking—non rusting

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East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

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Vol. 69
No. 25

Pages
1071-1124

CONTENTS

JUNE 18, 1927

Editorials 1071

Building and Maintaining Track in Salty Sand...1074

BY R. I. D. ASHBRIDGE.

In paved street the Atlantic City & Shore Railroad uses rigid construction with 9-in. grooved girder rail. In open construction 5-in. T-rail is used. To prevent rail corrosion sand is kept 1 in. below the tops of the ties.

Bearings Made of Lead Brass..................1077

Composition used by the Market Street Railway is said to have exceptional qualities. Reclaimed scrap totals four-fifths of the materials used in manufacture. Rapid methods used for machining cut cost without loss of accurate fits.

Transportation—A Study in Evolution 1079

Correct Motor Repairs Keep Gear-Center Distance Accurate 1080

BY P. A. PONTIUS.

The ten surfaces on which wear will cause spreading of gear centers should be brought back to correct dimensions at each motor overhauling. Maximum machining allowances for proper repairs are given.

Motorman's Stool Chained to Platform 1084

Milwaukee Completes Important Rapid Transit Link 1085

Twenty-three minutes running time to be saved between terminals on Burlington-East Troy line by the new cut-off.

You Can't Sell Cotton Goods in a Silk Age......1087

BY CHARLES GORDON.

A. Taurman—Winner of May Contest Prize......1090

Maintenance Data Sheet 1091

The Adventures of Old Man Trouble..........1097

Improved Equipment 1098

Association News and Discussions 1101

Don't Be Too Easily Satisfied, Urges President Sawyer 1101

Preservative Treatment of Pine Poles..........1103

BY E. F. BOEHNE.

Mileage the Logical Basis for Bus Depreciation..1104

BY D. E. BLAIR.

Simplifying Car Inspection 1105

BY J. E. WATKINS.

American Association News 1107

News of the Industry 1109

Recent Bus Developments 1114

Financial and Corporate 1116

Personal Mention 1119

Manufactures and the Markets..................1122

Look Behind to See Ahead

SINCE Lot's wife was turned into a pillar of salt for looking behind at the wicked city times have changed. The successful railway operator nowadays frequently looks back to the past so that in the future his management will profit by the record of what has gone before, be it good or bad. Among other questions, he must ask himself the following:

"What is the general level of wages today, what was it in the past, and what is it likely to be in the future?

"Are the patrons of my road paying a reasonable fare for the services rendered? What are railway riders charged in other cities? What was an average fare before and since the war?

"What do materials cost? What is the wholesale commodity price and the retail price? How have they changed and what are the trends?"

The most accessible reference on important questions such as these is the Richey Conspectus of Indexes, which is published in the fourth issue of each month. Here there is given in highly condensed and convenient form a month to month compilation of basic indices. In this tabulation are included figures from other authoritatitve sources such as the American Electric Railway Association, *Engineering News-Record,* Bradstreet's and the United States Bureau of Labor Statistics.

Men who know how to make use of these figures are the industry's pillars of progress.

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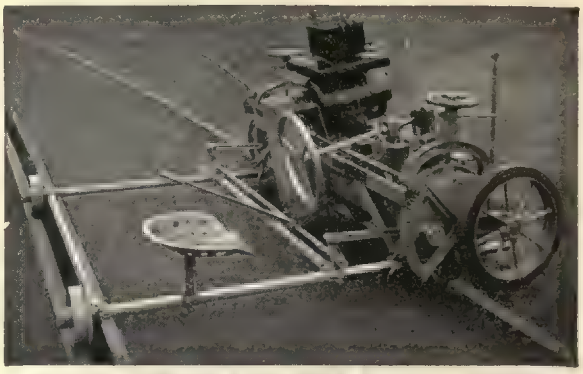
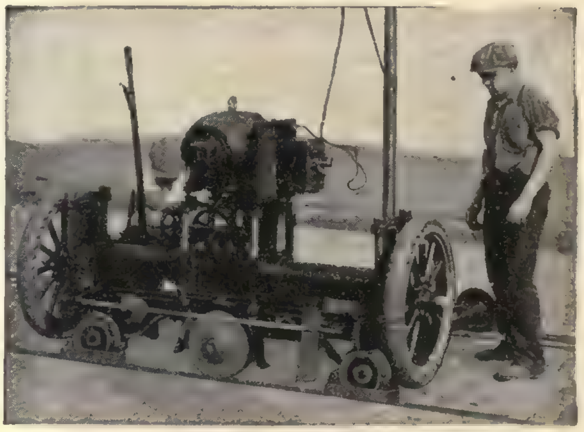
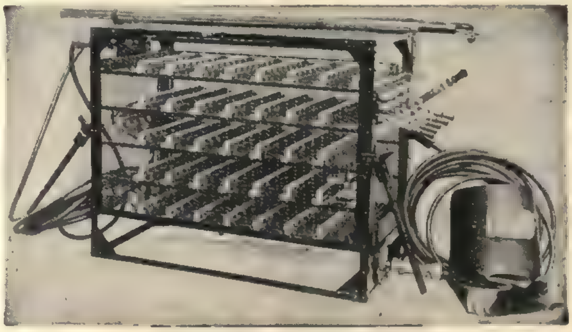
SAVING THE RAIL SAVES THE RAILWAY

Take the first step FIRST


"Improved Atlas" Rail Grinder


"Imperial" Track Grinder

Reciprocating Track Grinder


"Ajax" Electric Arc Welder

One road after another is proving that improved service, decreased expense and improved net go hand in hand.

Most of the successful rehabilitations have shown, too, that track reconditioning is the logical start.

No matter how much or how little you plan to do toward improving service, take the first step first—rejuvenate your rail.

With the modern equipment shown here it costs little to grind out corrugations, build up and grind low joints and repair battered special work.

And it pays—handsomely!

Evidence? Bulletins?
Quotations? Say the word.

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AGENTS:
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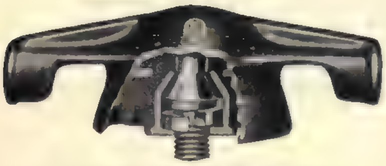
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
H. F. McDermott, 208 S. LaSalle St., Chicago
P. W. Wood Railway Supply Co., New Orleans, La.
Equipment & Engineering Co., London
Frazar & Co., Japan

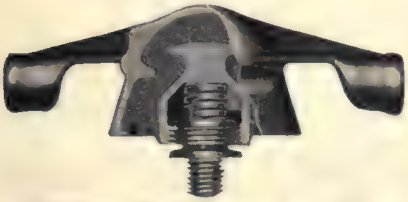
1821

SAVING THE RAIL SAVES THE RAILWAY

Slice off a Little More for the Net



O-B Lock Hanger, Span Type
Catalog No. 11062



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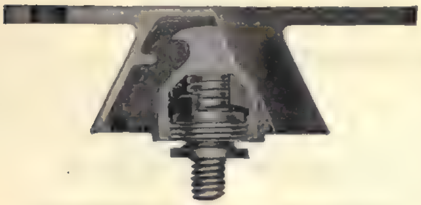

O-B Spring Lock Hanger, Barn Type
Catalog No. 14533

IT takes a mighty firm grasp on the transportation dollar to keep even a little portion of it from slipping through your fingers as expenses mount. Yet only 1% saved in operating expense adds nearly 20% to the net—making 6.7% instead of 5.7%.

Let better line material do its share toward helping you hang onto more of the dollars for net income.

Performance records substantiate the claim that O-B Hangers last longer. Repeat orders attest the satisfaction of users. Dirigo Insulation in O-B Hangers, for instance, prevents line drops and hanger replacements, which result from softening or cracking of insulation and pulling-out of hanger studs. Longer life and more trouble-free service are due also to the steel spring washer construction of O-B Hangers. A permanently tight joint is made between hanger and ear, protecting the threads from deterioration caused by rust and vibration.

Three widely used O-B Hangers are illustrated. For detailed information get in touch with the O-B representative or address

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
428B

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LINE MATERIALS
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Balanced Braking

Double the Braking Area—

Double it—and you decrease over 50% the required energy absorption per brake shoe.

Double the braking area and you greatly increase the friction coefficient.

Double it and you can attain a higher rate of retardation.

Double it and you decrease the frequency of brake shoe replacements.

The "SIMPLEX AND AMERICAN MULTIPLE UNIT" clasp brakes with two brake shoes per wheel instead of one, doubles the braking area and accomplishes these results.

AMERICAN STEEL FOUNDRIES
NEW YORK CHICAGO ST. LOUIS

American Multiple Unit Clasp Brake

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Car Signals

ELECTRIC SERVICE SUPPLIES COMPANY

THE installation of these reliable and convenient passenger signal systems enables passengers to signal the operator without commotion, and distraction of his attention. Made for every requirement—high or low voltage systems, buzzers, vibrating bells or single-stroke bells, resistance panels, flush or surface type push buttons. A convenience your passengers appreciate.

In planning a remodeling program or a new car building program, in ESSCO CATALOG No. 7 you will find a complete line of Keystone Car Specialties that provide for increased attractiveness, comfort, convenience and safety.

Write for your copy of ESSCO Catalog No. 7

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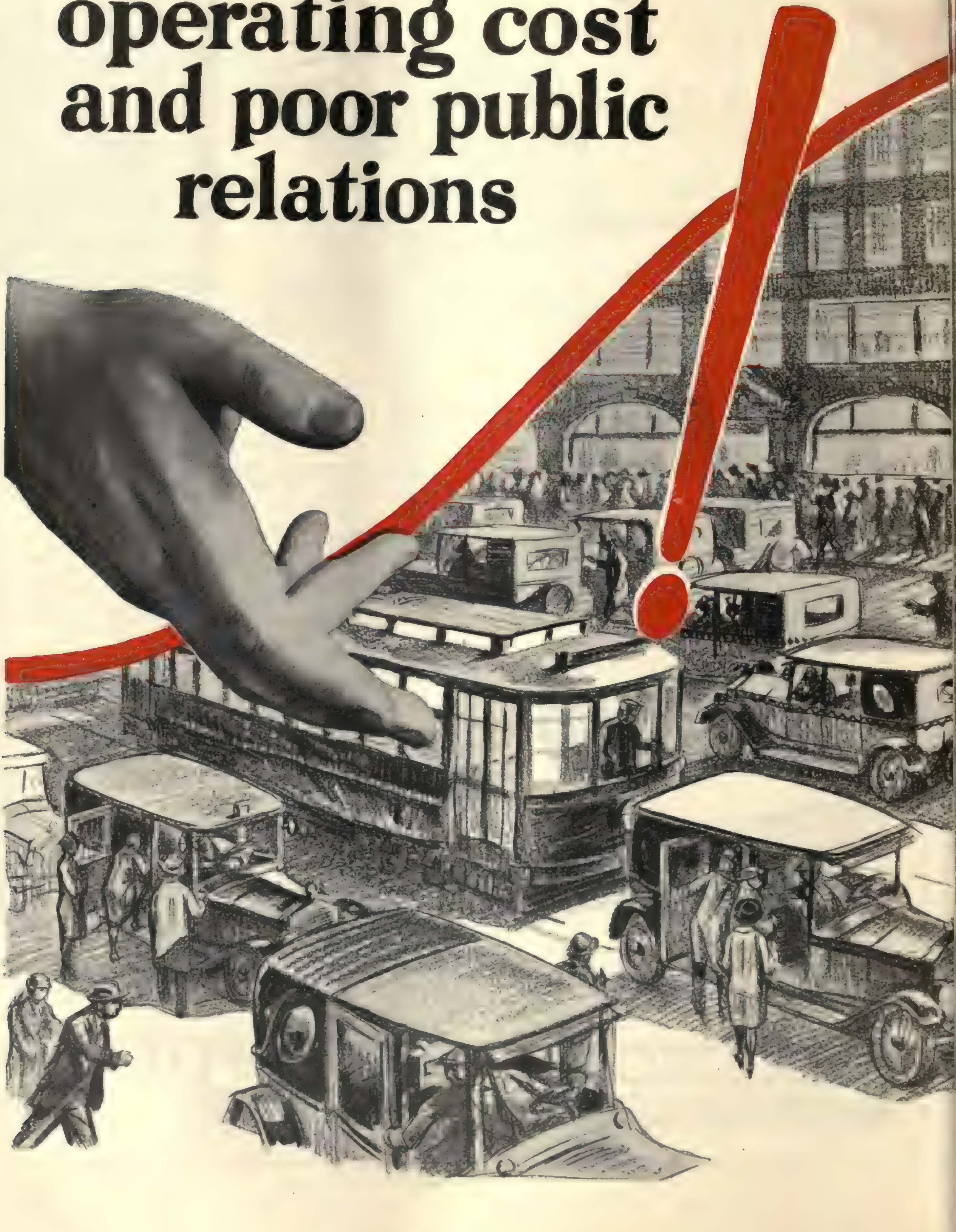
ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

There goes high operating cost and poor public relations



Turn *such obvious losses into profits~ with new equipment*

The public demands modern transportation and is ready to pay for it—but not in obsolete, awkward looking, uncomfortable cars. Stand on the streets of any city where such equipment operates. Note the empty cars. Their very obsolescence is reflected in the public's choice of other more attractive methods of conveyance.

And diverted fares are not the only loss to the operating company. Those old fashioned, heavy cars are eating into profits through high power costs, excessive car and track maintenance.

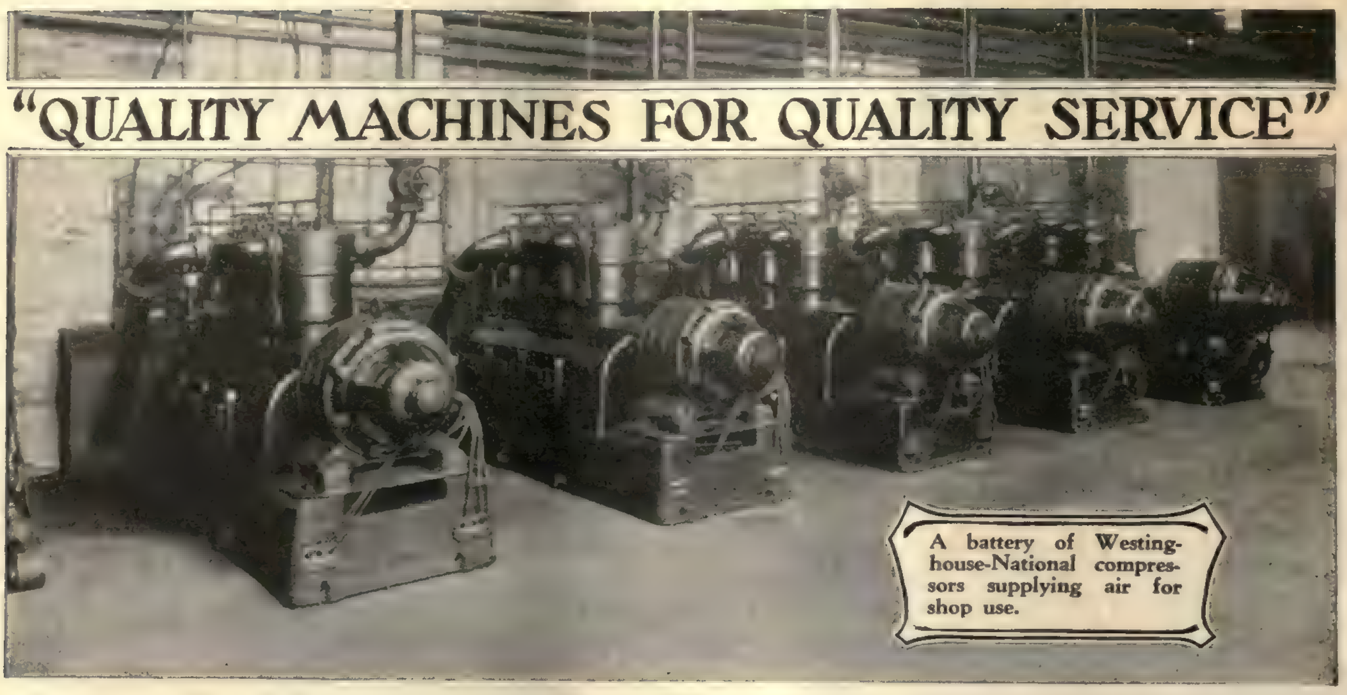
Progressive railway executives are getting tangible evidence that these losses can be turned into profit with modern, lightweight St. Louis Quality Cars—cars that build patronage and public favor. Such cars pay for themselves in reduced operating costs alone! Check up this statement with properties that have already shown the way. Make your own investigation or ask us to supply the facts.

built by

St. Louis Car Co.

Quality Cars

"QUALITY MACHINES FOR QUALITY SERVICE"



A battery of Westinghouse-National compressors supplying air for shop use.

WESTINGHOUSE-NATIONAL Air Compressors come as complete units ready for quick installation and immediate use, occupy minimum floor space for a given air capacity, run without vibration, need little attention, possess a positive lubricating system, and have a unique Automatic Control which insures minimum power consumption.

They are the product of a long established manufacturing policy that places durability and economical operation above the all-too-often first cost consideration. One user says, after five years' experience, "we have run them repeatedly day and night for periods of months at a time with practically no attention or repairs." Truly, they are "quality machines for quality service."

Westinghouse-National Air Compressors are available in all types—stationary or portable, steam driven, belt-driven or motor driven, for operation against low, medium, and high pressures, and on all commercial electric circuits—in sizes ranging from 3 to 700 cu. ft. displacement.

Install a Westinghouse-National Compressor to insure steady, profitable results from your pneumatic machinery in power house, car barn or shop.

Descriptive literature covering Westinghouse-National air compressors will be furnished upon request.

Westinghouse Traction Brake Company

General Office and Works: Wilmerding, Pa.

WESTINGHOUSE—NATIONAL
Air Compressors

Safety Insurance

Safety in steering is vital. Mack goes to extremes to assure it.

To assure safety in steering, Mack takes exceptional precaution—

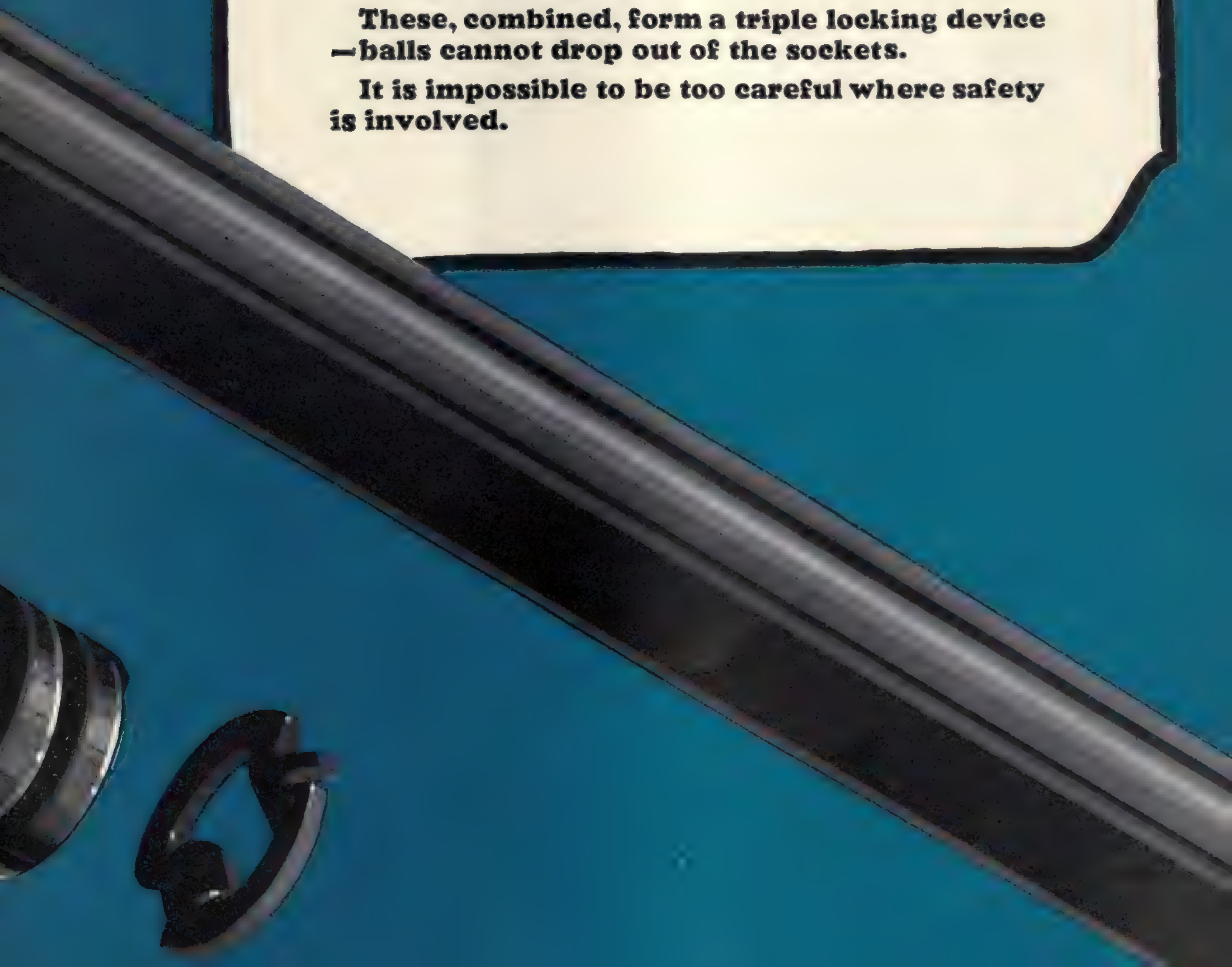
The Mack drag link combines strength and flexibility in a design that provides for every possible contingency. Strength from a single piece of seamless alloy steel tubing. Flexibility in ball sockets of exceptional size.

Balls are inserted through keyhole slots, retained by socket plugs threaded into the split ends of the link.

A. Drop forged clamps lock the threads.
B. Clamp screw presses on flat side of socket plug, keeping the plug from turning.
C. Clamp bolt is prevented from turning by a flat side of its head resting on the clamp. Also held by castellated nut, lock washer, and cotter pin.

These, combined, form a triple locking device —balls cannot drop out of the sockets.

It is impossible to be too careful where safety is involved.



The Northwestern Electric Service Company uses Macks on the routes of its subsidiary, The Pennsylvania Public Motor Coach Lines, to supplement traction service.

There is no Question About Quality!

The Northwestern Electric Service Company, with long experience in transportation, uses Mack buses. They have an appreciation of quality; of that quality resulting from a Mack ideal—Mack must be the finest.

The Northwestern Electric Service Company pays much more for a Mack—but they know that it costs them less.

Attention to details, as in the drag link, earns for Mack the patronage of those who know true values.

Mack Trucks, Inc.
International Motor Company
25 Broadway, New York City

NP

SPEED—

RUNNING SPEED
IS ONLY HALF OF IT—

Schedule speed is composed of two factors. Running speed and standing time. Shorter stops, therefore, are of as much importance as increased running speed and NP Door and Step Equipment which speeds up the interchange of passengers—is just as necessary to faster schedules as the use of modern motors.

NATIONAL PNEUMATIC COMPANY
Executive Office: Graybar Building, New York
General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
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PHILADELPHIA
1010 Colonial Trust Building

Cincinnati *New* Trucks

A threefold contribution to modernized service

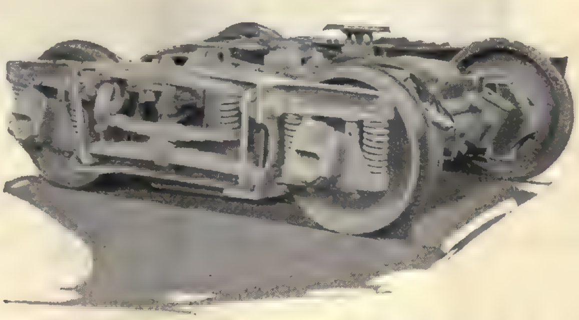
First in the development of both high-speed and moderate speed truck designs, which, while meeting exactly the requirements of modernized service for rapid acceleration and deceleration, silence and utmost riding comfort, *have behind them sufficient weight of operating data to make their purchase an investment of known value.*

Second, in the practical application of the Duplex Air-Magnetic Brake to both high and moderate speed service, bringing the advantages of positive braking, despite unfavorable track conditions, within reach of every operator through a thoroughly tested and perfected installation.

Third, in a radical improvement over conventional springing arrangements, assuring utmost riding comfort on modern lightweight cars *and absolute stability at speeds as high as 60 mph.*

These three things have come as the direct result of BALANCED DESIGN,—simplification of construction; the liberal use of modern high carbon alloy steels, and the careful balancing of every smallest part in its relation to the unit as a whole.

The engineering details of these important developments, together with blue prints will be furnished, on request, to any interested electric railway executive.



CINCINNATI CAR COMPANY
Cincinnati, Ohio

CINCINNATI
New
CARS

A step ahead of the modern trend

Power consumption reveals mechanical defects!

Tight or dragging brakes—motor working unsatisfactorily for any reason, such as faulty connection, open armature coils, short fields, etc.—nosing trucks—and many other hidden mechanical defects, collect their toll in increased power consumption! All of these defects are quickly detected when cars are equipped with

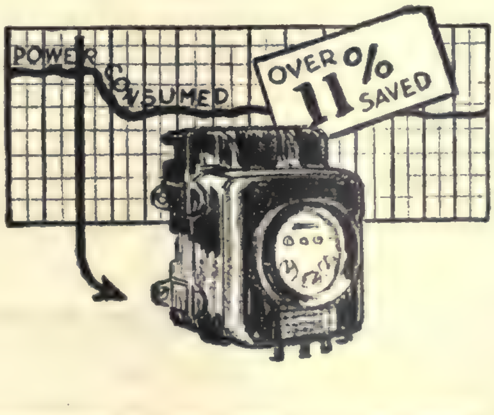
ECONOMY METERS

Ask your master machanic how hard it is to get most motormen to turn in "Car Defect" reports promptly and correctly. Often they wait for a serious breakdown before saying anything. The chief reason is that their own personal interests are not concerned.

But with cars equipped with *Economy Meters* the motormen, placed on a competitive power consumption basis, have a very strong incentive to see that their cars are kept in first-class condition, both electrically and mechanically.

Good motormen will detect otherwise hidden car defects through increased energy consumption. "Bad Order" reports will then come through promptly, for a grade "A" motorman can obtain a good record only with first-class equipment.

Let us tell you of other beneficial results obtained from the use of ECONOMY METERS*—results that prove they are worth their cost many times over!*



ECONOMY
ELECTRIC
DEVICES CO.
37 West Van Buren St.
Chicago, Ill.

Selling A Better Service

- - - - *at an economic gain*

Safety Cars are modern cars, whether they be new cars, or old equipment adapted to Safety Car Devices Control.

Safety Cars are modern cars, inasmuch as their feature of concentrated control, permits the operation of more cars, at faster schedules, at no increase over old operating costs.

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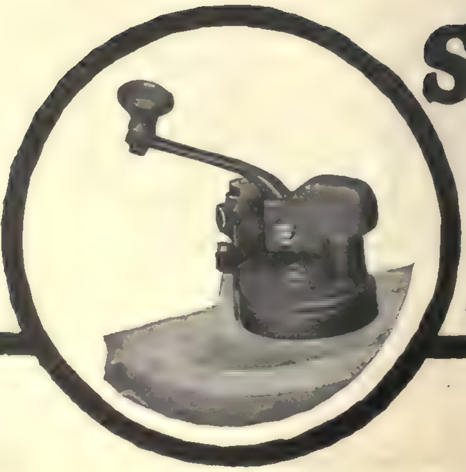

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
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CHARLES GORDON, *Editor*

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Use of Another's Idea Is a Mark of Ability

STRANGELY enough, among electric railway maintenance men there is a curious antipathy toward utilizing a method or device which has been developed on another property. Just what the cause of this feeling may be it is difficult to determine, but that it exists is common knowledge. Manufacturers' representatives who follow closely the maintenance practices of various properties are particularly conscious of the reluctance among maintenance men to admit the merits of the other man's ideas.

Even when visiting other properties with the expressed purpose of getting new ideas, there seems to be, somehow, a negative attitude. Each man tends to defend his own methods. He is inclined to shut his mind against what the other fellow is doing, instead of seeking actively anything good which he can apply.

No one man or group of men can hope to develop the best methods of handling the multiplicity of routine maintenance jobs that are encountered on a railway. Free interchange of experience and diligent search for new and better ways of doing an old job are safeguards against out-of-date methods. Use of other people's ideas is not a reflection on the ingenuity of the man who tries to apply on his property every idea which will increase efficiency, regardless of its source. It is quite the contrary as a measure of a man's ability as a maintenance executive. It is an indication of alertness, and if diligently followed out ultimately gives his property the benefit of the entire industry's cumulative experience.

Housing Type Axle Bearing Keeps Bearings Tight and Gives Longer Life

DEVELOPMENT of a housing type of axle bearing such as that used by Third Avenue Railway, New York City, and described in the May 21 issue, is of outstanding importance. The necessity for using a split type of axle bearing and a motor frame projection with an axle cap has made the operations of machining and clamping of axle bearings to keep the axle parallel with the armature shaft and to provide minimum clearances a trying problem. As the easiest solution, motor maintainers have been inclined to use loose axle bearing fits. These have proved dangerous to gears and pinions. Manufacturers of gearing have called attention repeatedly to the disastrous effects of spread gear and pinion centers in railway motors and to the decreased life that results when axles and armature shafts are out of parallel. They have a right to expect that gears and pinions will be operated with a minimum clearance for motor bearings so as to decrease the pounding and increase the mileage that results when gearing is kept in proper mesh.

The use of a housing type of axle bearing should permit these bearings to be operated with the small clearances found possible with armature bearings. The wedge key arrangement for holding the bearing should keep it tight in its housing and so do away with excessive wear at that point. By using a chuck of the same construction as the axle bearing housing for boring the bearing an accurate fit should result and parallelism between the armature shaft and axle be maintained.

The improved type of construction is also of advantage in keeping dirt and water from entering the bearings. These are two destructive agents that produce excessive wear.

How Can Definite Limits of Wear for Motor Fits Be Established?

MUCH helpful information on desirable limits of wear to assist in maintaining true gear-center distance for railway motors is given in the two articles by P. A. Pontius, the second of which is published in this issue of ELECTRIC RAILWAY JOURNAL. In a modern railway motor, he points out, there are ten places at which wear causes spreading of gear centers. The wear in service at these ten points differs widely and so the repairs to bring the fits back to the desired machining allowances come at different periods. At one overhauling perhaps only one of the ten surfaces has reached the limit of wear set as the condemning point. The others are worn but have not been worn to the limit. If they are allowed to go without repairs until the next overhauling they may be worn far beyond the maximum desired. When, then, should repairs be made? This is the complicated problem that must be solved by the maintenance forces.

As an aid in deciding how much a motor fit may be worn before repairs should be made, the author gives maximum limits for wear at each of the ten surfaces and recommends that each railway property keep records of the wear for these different points during the standard overhauling period. With such a record, limits can be established at which repairs must be made and the department head can be sure that the motor will run without danger until another overhauling period.

This is but one part of the investigation that is needed. The overhauling period used may not be so adjusted that it will come at a time when most parts require repair or scrapping. Accurate records of wear will help to determine this correct period.

This is the issue in June that is devoted essentially to maintenance and construction subjects

Proper maintenance of these motor parts should not end with repair or replacement, but an attempt should be made to improve the parts that have the shortest life so that they will last a multiple of the longest overhauling period. In the first article, desirable limits of wear were established; in the second, maximum machining allowances for proper repairs are given. Operators may use these as a basis for careful investigation of their service conditions with a view toward establishment of definite limits of wear based on recorded experience.

Take a Leaf from Canada's Notebook!

PROBLEMS of electric railways are not in any essential respect different in Canada from what they are in the United States, although with the severe winter conditions they are, if anything, more difficult. This was quite evident to any one who attended the Winnipeg convention this month. It is significant that the Canadian operators are giving fully as much thought to the developments of the day as are those on this side of the border. One of the topics which came in for a lively discussion was the treadle door. Railways large and small are finding that it makes practicable the use of one-man cars in many situations where it formerly has been considered necessary to continue two-man equipment.

Another significant discussion centered on the safety of various types of cars. Without exception it was the experience that the one-man car is safer than the two-man car. Not only do the safety devices which are incorporated in the modern one-man car make certain types of accidents impossible, but the centering of responsibility on the one operator eliminates confusion and the opportunity of blaming another for one's shortcomings.

The comments of the Canadian railway men carry the more weight in that the methods used by them have proved successful, if one can judge by the results. The survey of the properties throughout the Dominion made by the Canadian Electric Railway Association and published in ELECTRIC RAILWAY JOURNAL for May 14 indicates that during the past year business has increased on all but two of the roads that reported their results. Surely this is a record which indicates that the work of furthering modernization of plant and of methods carried on by the industry in Canada over the past several years is bearing fruit.

Simplification as a Means of Reducing Maintenance Costs

FOR some years Secretary Hoover's Division of Simplified Practice has been urging the elimination of unusual or unnecessary sizes and forms of products as a means of reducing waste and increasing the general efficiency of American manufacturing methods. Ray M. Hudson, chief of the division, has recently pointed out that manufacturers faced with the problem of steadily declining price levels can reduce production costs through elimination of the less popular sizes and varieties, with resultant saving in both production and distribution. It has been definitely proved, he says, that diversification adds both to production and to selling costs. While this has been surmised by all students of the problem for years, it is significant that Mr. Hudson has gone to the trouble of obtaining definite proof for it.

The same arguments that apply to manufacturing processes hold equally well for the railway in maintaining its plant. A diversification of equipment or of track construction can lead only to the multiplication of processes of repair, with resultant higher costs. Many of the most prosperous companies have but one or two standards of track and a like number of standards for cars. Perhaps it may be argued that a more judicious choice would be better for some particular route or piece of track. Be that as it may, the necessity of having diverse methods of maintenance fitted for the various types of construction will more than likely outweigh the advantages.

Even with old equipment it is possible to go far in the simplification of parts. As they wear out fittings of various sorts may be replaced with the company's standard. Motors or trucks of odd types may be retired to make way for others that are standard on the property.

Savings made in this way are of several kinds. Reduction of stock means that a lower inventory can be carried, and orders can be made larger, so that better prices and deliveries can be obtained. Repairs can be made more quickly and more accurately, as workmen are able to become more familiar with the limited number of processes developed for repairs. When the repaired cars go into service the chance of failure is lessened as the work is better done due to the concentration of effort on a limited number of types. The time a car is held out for repair is less, as it is seldom necessary to wait for a part to be ordered from the factory. With all these advantages, it behooves every maintenance man to investigate fully the possibilities of this attractive field for cost reduction.

Conference Leaders to Be Trained During the Cleveland Convention

ONE American Electric Railway Association committee whose activities have given tangible results in the last two years has been that on education. Last year, following several demonstrations of how to conduct a foremen's conference presented at several sectional meetings, the committee on education presented an actual foremen's conference at work before the American Association at the last Cleveland convention. This year it is planned to carry the work still further and provide an actual school operating four hours a day from Monday until Saturday during convention week at Cleveland, to which operating companies may send representatives to train for the work of conducting foremen conferences on their properties during the coming year.

At the meeting of the committee on education, reported elsewhere in this issue, it was decided to head the instruction group by H. H. Norris, educational adviser of the Boston Elevated Railway, and A. J. Sarré, occupying a similar position in the New Orleans Public Service, Inc. Tentative plans were also developed to call in the services of Frank Cushman of the Federal Board for Vocational Education, Washington, D. C. Messrs. Norris and Sarré are well known in the industry, having had many years of public utility experience to their credit. Mr. Cushman likewise is considered one of the best exponents on the conference method of instruction of foremen in industry as a whole. This triumvirate as leaders will not only do much to instill further interest into the foremen conference method of training for leadership, but it promises to do much more, as it will provide actual instruction for such men as come to learn how to conduct such conferences.

As planned, this group will be limited to 50 delegates and open to all member companies in the industry. It is expected that delegates who register will attend each of the six four-hour sessions in the mornings of convention week. With this program completed, it is expected that the foremen conference idea will take another important step forward in the actual work that should follow during the course of the year. It is gratifying indeed that this committee's activities have had so practical a result.

Satisfaction or Your Money Back

BUSINESS institutions in America as a whole have reached a level of honesty and idealism so high that today "satisfaction or your money back" has become a common motto. A dissatisfied customer has simply to state his claim and there immediately follows an adjustment. The desire to please has been recognized as a powerful factor in holding as well as securing patronage. As the result, claim or adjustment departments are a part of every well-organized industry.

In the majority of instances dissatisfaction may be proved in a tangible way. Whether one has purchased a paper of pins or an automobile the *modus operandi* of adjustment is comparatively simple. On the other hand, there are many things bought in the day's mart in which an intangible factor of dissatisfaction plays a major rôle, *per se*, the car ride. Few relatively cheap purchases present more claims of dissatisfaction or produce a greater adjustment problem than this popular form of transportation. For example: We may carry the passenger from A Street to Z Avenue—his desired destination. In the accepted sense we have fulfilled a contract, yet perhaps have failed miserably to create that sense of satisfaction that holds business. In short, we have been so engrossed in transporting a human being for a given distance that we have forgotten that that human being considers the distance traveled as only a minor part of the "commodity" purchased. We have forgotten that he who rides thinks. He is observing our unkempt rolling stock, indifferent and discourteous employees, uncomfortable seats, poor schedules and all the other inexcusable shambles which seem to shout lustily "the public be damned." Think for a moment! What would be the department store's chance for patronage if similar conditions obtained within its walls?

In all events, if such a condition exists on any utility, regardless of whether it has sold car-miles at a ledger profit or a loss, it has piled up an intangible debit that sooner or later will engulf all material gain. What is far worse, it has constituted itself a star salesman for private transportation. If we hold this view of our duty to the public we have forgotten also that the average passenger considers it a useless task to attempt an adjustment of his reactions. While elemental logic dictates that the company has from a material standpoint given him value received, he is nevertheless utterly dissatisfied. He immediately plans some sort of redress and he easily turns to the method made so simple by the price war of the automotive industry. He even considers "Shanks' mare" in the general plan.

How Far Have We Progressed in Adjusting These Claims?

THANK goodness, communities in which so depressing a complex exists as that mentioned in the preceding editorial are rapidly approaching a minority. Every issue of the JOURNAL carries numerous articles on new and rehabilitated equipment, on courtesy and modern management that sustain such an assertion. This is encouraging, but not the whole answer. While the industry is rapidly realizing the danger and has taken giant strides in the right direction, it has yet a final step to take in investigating the car rider's psychology. This step has been boldly taken by the Pittsburgh Railways and was concretely outlined before the Canadian Electric Railway Association by W. H. Boyce, commercial manager for the company. His discourse, "Development of Miscellaneous Revenue," abstracted in last week's JOURNAL, page 1055, read:

"The director of public relations is a liaison officer in relations with the police and fire departments, county detectives and other municipal representatives. He is also the clearing house for all complaints, commendations and suggestions from the patrons of the company. Whether these come in person, by mail or by telephone, no complaint is left unsettled. In the case of complaints by mail, personal visit at the home or office of the complainant is the regular practice. In other instances, where a laborer has been hunted up at his work, the employer himself has secured a new light on the earnestness of the management."

Here is the next and concluding step which will bring the electric railway industry to its new goal—mental and physical satisfaction per car-mile sold. To reach this goal we must continually have in mind the question: How far have we progressed in adjusting the passenger's intangible claims? "Satisfaction or your money back" must be included in the industry's creed.

Avoid Confusion by Keeping Records Up to Date

WITH the passage of time styles change in names as in all other things. "Smith's Corners" adopts the dressier cognomen of "Fairlawn." The old "Turnpike" becomes "Grand Boulevard." Cars which used to run on the "Crosstown" line now carry the more imposing designation "Broadway." Although it may be doubted whether all these changes are real improvements, they are of frequent occurrence, and the new names eventually become as well known as were the old.

Records kept by the electric railways are intimately connected with the names of towns and streets where the company operates. The way department has maps showing the position of its tracks. Often the line department designates its cables and feeders according to their location. The mechanical department may classify the rolling stock by the lines on which the cars are operated. When a street name or a route is changed, records should be altered to correspond.

Needless confusion results when different departments use different names for the same thing. If the transportation department wants 100 pads of transfers for the "Broadway" line, it should not be necessary to look on the "Crosstown" shelf in the store room. This sort of thing can be avoided if careful attention is paid to keeping records up to date.

Building and Maintaining Track in Salty Sand

In paved street the Atlantic City & Shore Railroad uses rigid construction with 9-in. grooved girder rail. In open construction 5-in. tee rail is used. To prevent rail corrosion sand is kept 1 in. below the tops of the ties

By R. I. D. Ashbridge
Chief Engineer Atlantic City & Shore Railroad, Atlantic City, N. J.

DESIGN and maintenance of track of the Atlantic City & Shore Railroad, Atlantic City, N. J., involve a number of unusual problems on account of ground conditions. The subgrade is salty sand and ground water is close to the surface. This necessitates particular precautions to prevent rail corrosion. Another element which has an important influence on the design of the track structure is the operation of steam railroad freight equipment over the same rails as the electric cars.

On Atlantic Avenue, the principal thoroughfare of the city, where the trunk line of the railway runs, the track is of the rigid type. Rails are 9-in., 141-lb. grooved girder Bethlehem section No. 263. They are laid with 15/32-in. tie plates on untreated long leaf yellow pine cross ties 7 in. x 9 in. x 8 ft. 6 in. Ties are spaced 2 ft. ¾ in. center to center. Under the track is a continuous 6-in. slab of concrete, with a 2-in. layer of broken stone under the ties tamped to bring the track to proper surface. The subgrade is a fine seashore sand. The ties and the lower part of the rail are incased in concrete.

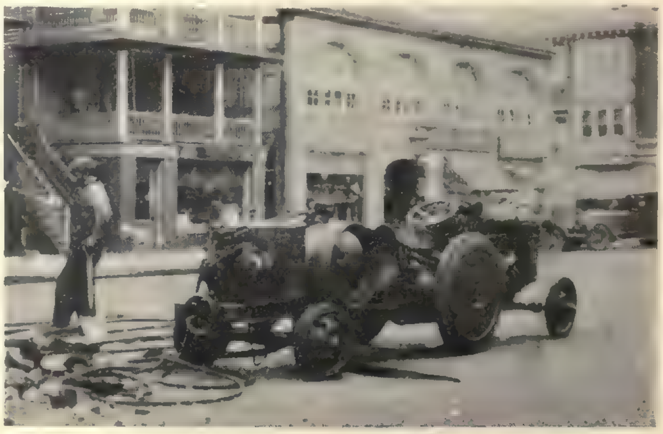
The total depth of this track structure is approximately 24½ in., distributed as follows:

Rail	9 in.
Tie plate	15/32 in.
Tie	7 in.
Broken stone	2 in.
Concrete slab	6 in.
Total	24 15/32 in.

Opening up track on Atlantic Avenue preparatory to reconstruction

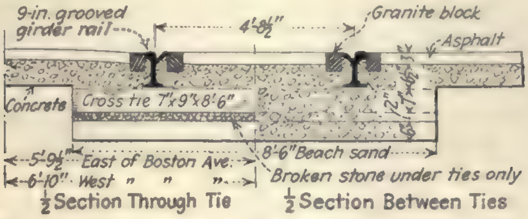
One row of granite block stretchers is laid along each side of each rail. A 1:2 Portland cement mixture is used as a filler between the rails and the blocks. Joints between rail and paving block are sealed with Genasco paving filler. Except for the area immediately along-

Pneumatic socket wrench is used to tighten the screw spikes used in Atlantic City

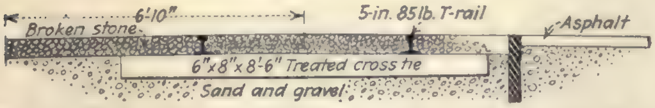


Air for pneumatic tools is obtained from a compressor mounted in rear of a Fordson tractor side the rail, where the granite blocks are laid, the paving surface is a 3-in. layer of asphalt laid on the concrete which incases the ties and the lower part of the rail. A cross-section of this track structure is shown in an accompanying drawing.

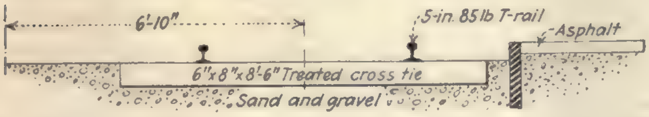
This track was built in 1906 in the manner outlined in the preceding paragraph. When it became necessary in 1924 to rebuild certain sections of the track a number of modifications were made in the design. This reconstruction work is still being carried on, as conditions require, according to the design adopted at that time.



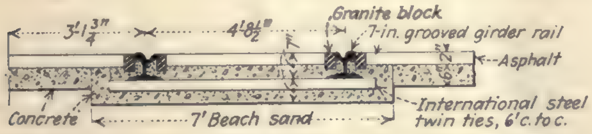
Rigid track structure on Atlantic Avenue has a total depth of about 24½ in.



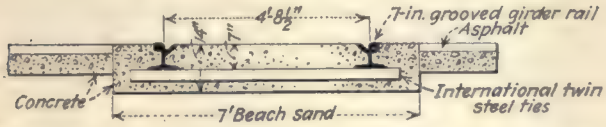
In the residential suburb of Ventnor tee rail construction is used, filled in with broken stone



In Margate and Longport the track is laid in an unpaved reserved strip in the center of the street


3'-1¾"
4'-8½"
Granite block
7-in. grooved girder rail
Asphalt
Concrete
7' Beach sand
International steel twin ties, 6' c. to c.

On Virginia Avenue, Atlantic City, the track structure has a depth of 14 in. with International steel ties



Monolithic construction in Ocean City with concrete paving in the track area

The process consists of opening up the pavement along both sides of the rail as far down as the tops of the ties, shimming up rails where necessary, drilling new holes in the tie plates and fastening the rails with ⅞-in. screw spikes and cast-iron clips to the ties which are inclosed in concrete. Standard railroad cut spikes with chisel points formerly had been used. Trouble was experienced, however, from corrosion. In some places the base of the rail was eaten away to such an extent that the spike was no longer effective. This difficulty has been overcome by the use of the screw spike and iron clip. A pneumatic drill and auger are used to bore holes for the screw spikes and a pneumatic socket wrench to tighten them. The air supply for the pavement breaker is obtained from a compressor mounted behind a Fordson tractor and operated by the tractor engine. The drill, auger and socket wrench are operated by air from an electrically driven air compressor.

After twenty years of service the untreated pine ties on Atlantic Avenue are still in good condition. Approximately 10 per cent of the joints have become loose at one time or another, and the receiving rail become cupped. These cups have been built up by welding and grinding. During the reconstruction work where the rail ends have been found cracked by drilling or broken by the heat of welding, the joints have been cut out and 10-ft. "dutchmen" inserted. New plates have been installed where it has been thought desirable to strengthen the joints. In such instances cable bonds have been carried around the joints and buried in the concrete back-filling.

New granite block stretchers have been laid outside the rail. Old blocks which remain in good condition are laid along the inside lip of the rail. Cal is used in all concrete to hasten the setting of the cement and to prevent freezing in cold weather. As it is not possible to reroute the cars this work has had to proceed under traffic. During the summer season, from June to the middle of September, traffic is so heavy that the work has to be discontinued altogether.

On this track, where the 9-in. girder rail is used with the heavy concrete foundation, there has been a great deal of rail corrugation. This has been removed from time to time by means of rotary grinders, reciprocating grinders and grinding blocks attached to the underside of a car by heavy springs.

TEE RAIL USED IN OPEN CONSTRUCTION

In Ventnor, a residential suburb lying to the south of Atlantic City, the track structure of the Atlantic Avenue line consists of tee rail laid on treated ties. The subgrade is sand and gravel. By ordinance a layer of broken stone extending from the top of the tie to the top of the rail is required. Since the rail was laid in 1912 and this stone placed the crevices have been more or less filled with salty seashore sand carried by the wind. This has accumulated along the base of the rail and around the spike heads. A combination of vibration of the rails under traffic and arcing between rail and spike has cut away the base of the rail at the spike heads as far back as the web in some instances. For this reason the average life of the rail in this type of track is only about fifteen years, although the head remains in good condition for a much longer period.

The adjoining municipalities of Margate and Longport have not insisted upon the filling of the track area with broken stone. Careful attention is given to keeping the sand about 1 in. below the tops of the ties. Track is laid practically on the beach at Longport, however, and it has been impossible to keep the base of the rail free of sand. Much trouble has been experienced from corrosion. Painting the rail with red lead has been tried in Longport, but has not proved altogether satisfactory. In spite of all precautions the life of rail averages only about sixteen years. In this atmosphere the joint plates corrode very rapidly and have to be replaced at frequent intervals, even though they are oiled from time to time.

STEEL TIES USED IN LATEST RECONSTRUCTION JOBS

During the spring of 1925 the double track on Virginia Avenue, Atlantic City, between the Boardwalk and Atlantic Avenue, was rehabilitated. This track is used by the multiple-unit interurban trains of the "Shore Fast Line." New 7-in. grooved girder rail was laid on International twin steel ties imbedded in con-

When reconstructing track in paved street, new granite block stretchers are laid outside the rail, while the old blocks are used inside

Monolithic construction with 7-in. grooved girder rail and concrete paving in the track area at Ocean City

crete, in 62-ft. lengths, with the ends milled and undercut. Staggered machined joint plates 22 in. long are held in position by four heat-treated bolts as well as top and bottom seam welds. A 7-in. concrete slab was laid below the base of the rail. Granite block stretchers are used on both sides of the rails. Elsewhere the concrete extends to within 2 in. of the surface. Paving is sheet asphalt. Great care was taken in this work to ram the concrete thoroughly under the rails and the ties. The total depth of the track structure is 14 in. as shown in an accompanying drawing.

Single track on Eighth Street, Ocean City, from West Avenue to the Boardwalk, a distance of approximately 2,000 ft., was rebuilt in 1926. It had been laid in 1908 with 85-lb. A.S.C.E. rail on reinforced concrete girders, the rail being secured to cast-iron yokes with bolted clips. Due to frequent undermining for the installation of water and gas service pipes, electric conduits, etc., the track was in bad condition. Because the city desired to widen, repave and otherwise improve the street, the company consented to rebuild the track with 7-in., 128-lb. grooved girder rails. They are 66 ft. long, with ends milled and undercut. Joints have staggered 22-in. machined plates seam welded. As on Virginia Avenue, the rails are laid on International twin steel ties imbedded in concrete, which has a total depth of 14 in. In this instance, however, the street paving wearing surface in the track area is of concrete instead of asphalt. The slab was laid as a monolith, making the track structure as nearly rigid as possible. This type of track on Eighth Street, Ocean City, and on Virginia Avenue, Atlantic City, has proved very satisfactory so far. No sign of joint failure has been detected and the track is nearly noiseless.

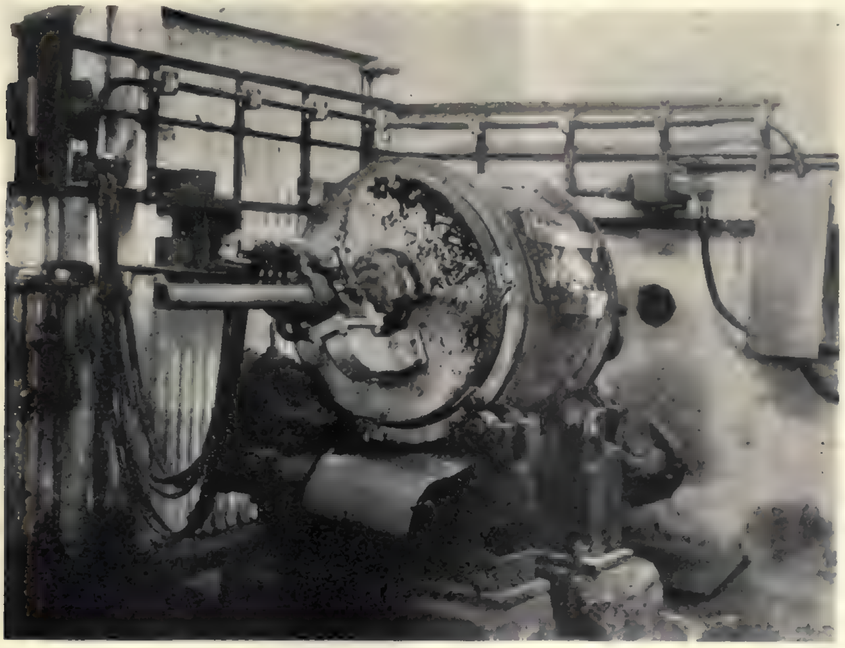
On one of the subsidiary lines on the salt meadows between Atlantic City and the mainland, where there is not more than 6 in. of ballast between the sod and bottom of cross ties, and where the salt water from storm tides sometimes covers the track, it has been found that there is great difference in the life of the untreated cross ties used. Chestnut ties last only three or four years, while many of the short leaf pine ties have lasted 24 years, though badly cut under the rail. This is believed to be due to the absorption of salt. Untreated long leaf pine ties also have a long life in the same locality, though few have been used. Life of rails on this type of roadbed is comparatively short as the base corrodes very fast.

Open construction with 5-in. tee rail laid on creosoted ties is used in Margate

To prevent corrosion sand is kept at least 1 in. below the tops of the ties

Bearings Made of Lead Brass

Composition used by the Market Street Railway is said to have exceptional qualities—Reclaimed scrap totals four-fifths of the materials used in manufacture—Rapid methods used for machining cut cost without loss of accurate fits



Bearings, both axle and armature, are poured from an electric furnace

BEARINGS, both armature and axle, are produced in the shops of the Market Street Railway at a cost which represents a saving of approximately $15,000 annually. This saving is the profit derived from operating the brass foundry, if castings were charged out at market prices such as prevail on the Pacific Coast.

Materials for the manufacture of the lead-brass bearing which is now standard on this property are, for the most part, obtained from scrap motor coils, reclaimed bearings, trolley ears, trolley wire and other parts of car and line equipment originally manufactured in the shops. Some new materials are required, but these total only about one-fifth of the amount which goes into the furnace. For the year 1926 the following quantities of scrap and new materials were used:

	Pounds
Scrap brass	77,814
Brass borings	189
Scrap copper	77,292
Scrap lead-brass (original castings)	25,907
Scrap lead-brass borings	47,144
Total (old material)	228,346
New copper	16.512
New tin	8,348
New lead	16,524
New zinc	2,113
New nickel	413
New material used	46141

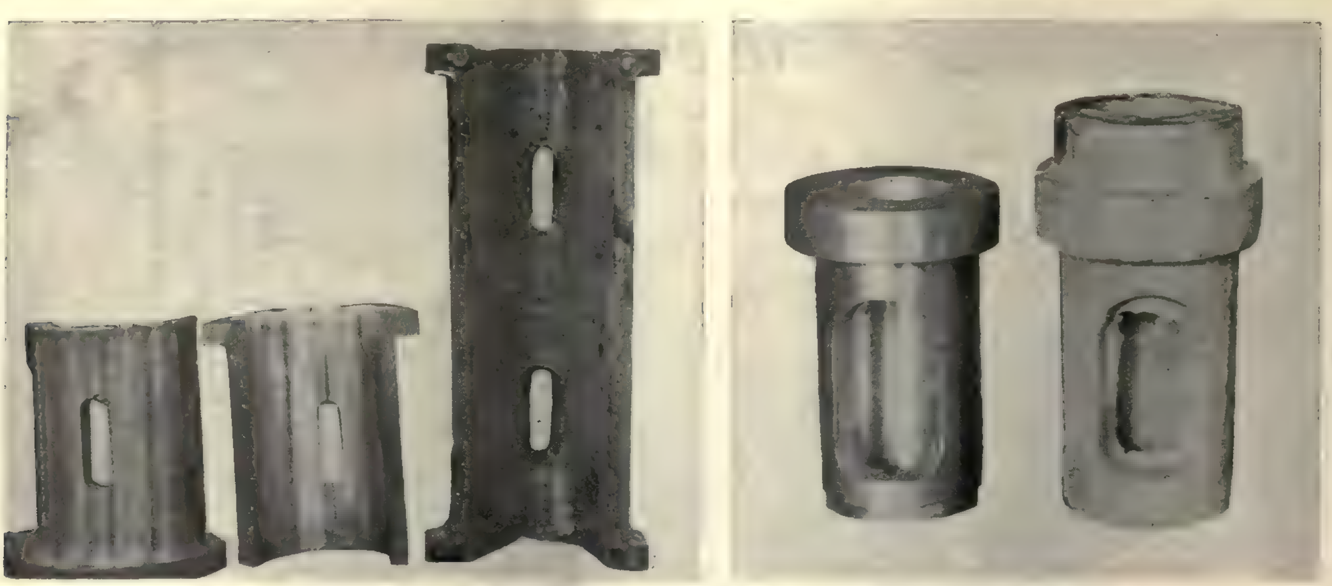
From these the following quantities of finished bearings, trolley ears and miscellaneous castings were manufactured:

	Pounds
Bearings	101,643
Trolley ears	23,671
Miscellaneous castings	50,171

Lead-brass was adopted for armature and axle bearings approximately two years ago. The replacement of the babbitt-lined bearings has been taking place since then and by the first of February, 1927, the entire equipment will be changed over from babbitt to bronze bearings. On motors equipped with the bronze bearings there has been only one armature down on the pole pieces in the past two years. This condition is a vast improvement over that which existed with the use of babbitt-lined bearings.

While manufacturing the bearings and other brass castings is on a small-quantity production scale, there is enough of this work to make it profitable. The composition of the bearings approximates closely the formula: Copper, 70 per cent; lead, 22 per cent; tin, 6 per cent. A slight variation is made for the manufacture of trolley ears and other castings requiring greater tensile strength than that needed in bearings. An electric furnace of the rotating type is used for melting the materials. This allows for a minimum of oxidation and results in a uniform pour which can be controlled accurately.

Axle liners are cast in pairs, end to end, with the flanges at opposite ends of the castings. Armature bearings are cast with an extended shoulder beyond the flange. These features facilitate the machining.



Castings for axle and armature bearings before and after finishing

At the left, finished axle liners compared with the double castings, in which form they remain until after the outside surface is finished. The view at the right shows how armature bearings are finished both inside and outside at one operation on a turret lathe. An extension shoulder beyond the flange of the bearing serves as a means of holding the bearing in the chuck of the lathe until it is cut off at the flange after the various machining operations are completed.

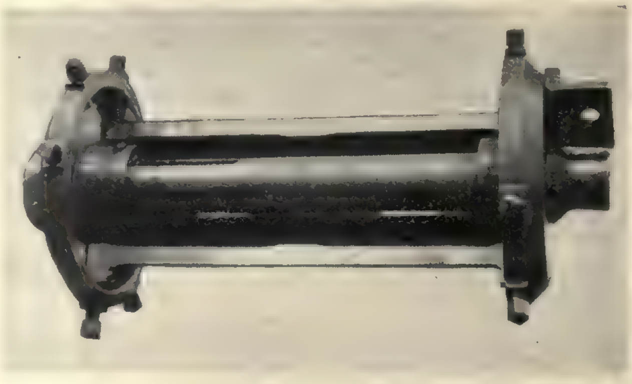
Machine work on the bearings is preceded by a thorough cleaning of the castings in the sand blast room. After this the axle liners are finished off on the joint surface by a horizontal rotating emery plate. Formerly the finishing of these bearings required a planer and the services of a mechanic for approximately five days per week. Now the finishing is done in the spare time of the mechanic who operates the wheel grinding machine. Between the time required for setting up a pair of car wheels in the grinder the mechanic has opportunity to face off all of the axle lining castings needed to keep the machine shop busy with this work. A gage developed to meet the requirements of this grinding has simplified the work to a considerable extent. It is D shaped, with one end open to slip over the casting. The straight-edge is placed on the ground surfaces while the point gages up the outside of the curved casting. An allowance of 1/16 in. over or under the gage is permitted.

After the surfaces are ground two castings are mounted face to face in a jig provided with adjusting setscrews so that the split will come at the exact center. This aligning of the castings is important in the finishing of axle linings on this property. An illustration of this jig with only one double casting in place shows how they are lined up. With two double castings held together in this manner the outside surface is finished up to and including the inside edge of the flanges. The two castings are then cut in halves to form two pairs of axle linings which are so exactly matched that any two finished linings will match up for a complete bearing.

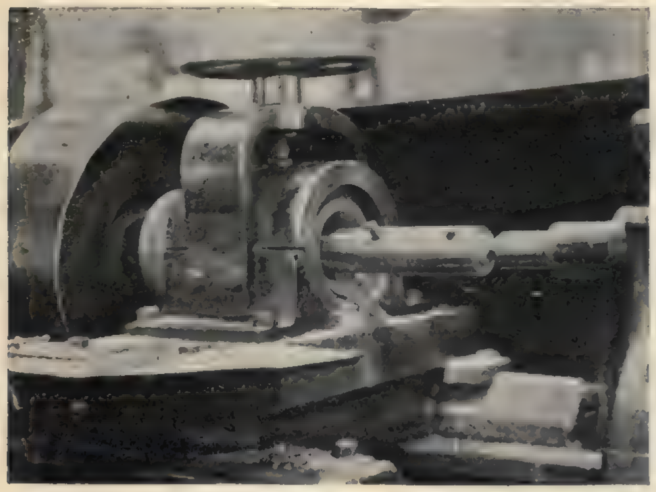
Pairs of axle linings with the outside finished are clamped in a taper chuck with the flanged ends out and finished ends on the inside. The outside end of the flange is also finished, the fillet being cut between the inside bore and the flanged surface. The oil grooves are cut by hand.

Four sizes of axle linings are made to fit into the various types of motors used. In addition, three varia-

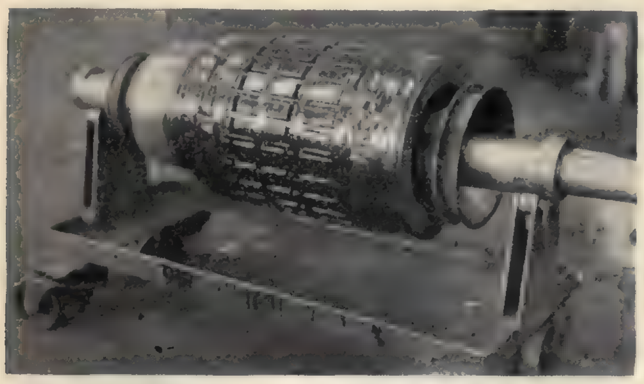
Axle liners are finished on the joint surfaces by a horizontal rotating emery wheel. The use of this wheel has saved the services of a shaper and a mechanic for five days per week



A jig holds two double axle lining castings face to face while the outside surfaces are finished. Gage lines, in the heads of the gage, center the split of the bearings so that any two halves match accurately



Final finish and fit are given the armature bearings in this fixture. A shaft clearance of 0.013 in. is allowed



Armature equipped with lead-bronze bearings used in the motors of the Market Street Railway, San Francisco

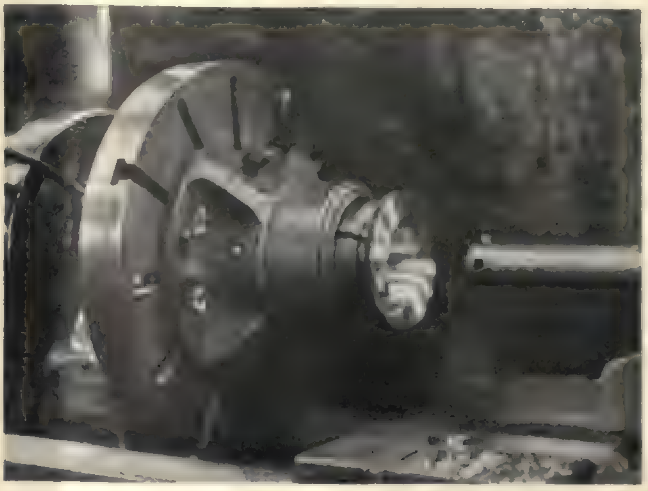
tions in inside bore of the four types are made to accommodate under-size axles. Finished axle bearings are marked in pairs and motor type number and size of axle stamped on the ends. They are placed in the storeroom to be drawn out on requisition.

Armature bearings follow a somewhat different process. The extended collar cast on the flanged end is held in the chuck of a turret lathe while the bearing is finished inside and outside in one operation.

The inside is bored the full length of the casting while the outside finish is carried up to the flange shoulder. The flange and end groove on the flange are finished, after which the bearing is cut away from the shoulder held in the chuck. Five types of armature bearings for both commutator and pinion ends are made. These are also bored in three sizes, namely $\frac{1}{8}$, $\frac{3}{16}$ and $\frac{1}{4}$ in. small. This allows for variations in armature shafts.

Final fitting of the armature bearing to the shaft is done by the armature department. The bearing is finish bored 0.013 in. larger than the shaft. Bearings are placed on the shaft and the pinion pressed on. The armature is placed on a rack pending installation.

Quantities of 100 bearings of the various types and sizes are manufactured at a time. This keeps the machines operating under what might be termed, in a small way, quantity production. It allows for economical performance and of course has been a factor in reducing the ultimate cost of the bearings.



Two halves of axle lining with the outside finished are held in taper chuck for boring on engine lathe

Transportation—A Study in Evolution

FOR several weeks in the window of the Philadelphia Rapid Transit Company's intercity motor bus terminal on South Broad Street, Philadelphia, appeared a rather unique transportation exhibit. It consisted of a series of artist's impressions of the various stages of transportation, starting with the caveman, who had to depend largely on his own legs to get over the ground, and covering progressively the chariot, the cart, the horse car and similar intervening stages until the modern gas-electric bus was evolved. The pictures were mounted on a device operated by an electric motor and which exhibited the scenes successively.

Electric lights, arranged behind the beaverboard frame of the exhibit, lighted the pictures and the cards of explanation on either side. Considerable interest was evoked by the passersby on Broad Street and while the device was in operation a large crowd was generally gathered in front of the window. The South Broad Street office is the terminal for the P.R.T. intercity bus routes to New York, Wilmington, Baltimore, Atlantic City, Trenton and Washington. De luxe, gas-electric parlor car buses are used on all of these runs and the recent exhibit was designed to show that these vehicles are the last word in safety, comfort and efficiency in public transportation.

P. R. T. tells a pictorial story of transportation through the years by means of this interesting device, located in the window of its intercity motor bus terminal, South Broad Street, Philadelphia

Correct Motor Repairs Keep Gear-Center Distance Accurate*

The ten surfaces on which wear will cause spreading of gear centers should be brought back to correct dimensions at each regular motor overhauling

By P. A. Pontius

**Renewal Parts Engineer Westinghouse Electric & Manufacturing Company,
East Pittsburgh, Pa.**

WHEN a motor has been taken out of service for overhauling, the question arises in the maintenance man's mind as to how the motor parts which affect the gear-center distance can be repaired and as to the proper machining allowances. This question is answered in the present article, in which the ten surface members under consideration are the same as those mentioned in the previous article. In regard to some of the terms used in this article the following should be noted:

1. *Nominal dimension* (in inches and fractions) is the theoretical or nominal standard to which the allowances have to be added or from which all variations are made.
2. *Basic dimension* is the theoretical or standard size from which all variations are made. The basic dimensions will include the allowances for fits.
3. *Limits* are the specified maximum and minimum dimensions permissible for any part.
4. *Tolerance* is the permissible difference between the limiting dimensions.
5. *Variation* is the limited deviation above or below the basic dimension that can be tolerated.
6. *Allowance* is the prescribed difference between the dimensions of mating parts to provide for various classes of fits.

Example: A bearing is to be pressed into a housing. The nominal dimension for both the outside diameter of the bearing and the housing bore should be 4¼ in. The dimensions should be specified on drawings as follows:

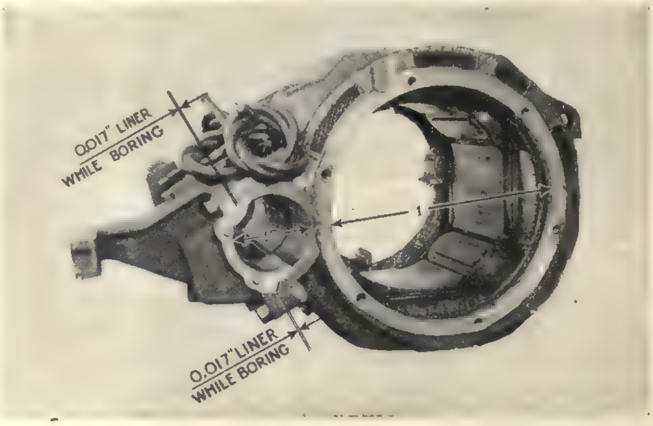
Outside diameter of bearing, 4.254 in. $\left\{\begin{matrix}4.254\\4.252\end{matrix}\right.$

Bore of housing, 4.249 in. $\left\{\begin{matrix}4.249\\4.251\end{matrix}\right.$

Nominal dimension, 4¼ in.
Basic dimension of bearing is 4.254 in.
Basic dimension of housing is 4.249 in.
Limiting dimensions of the bearing, 4.254 in. and 4,252 in.
Limiting dimensions of the housing, 4.249 in. and 4.251 in.
Tolerance of bearing is 4.254 in. minus 4.252 in. = 0.002 in.
Tolerance of housing is 4.251 in. minus 4.249 in. = 0.002 in.
Variations of bearings are 0 — 0.002 in.
Variations of housing are 0 — 0.002 in.

If the wear of the housing seat in the steel motor frame has progressed so far that a new or repaired housing will not fit tightly, the frame should be welded by adding new material and the housing fit should be bored to the same dimensions as on the new motor or, without welding, the frame should be rebored to a diameter larger than standard. However, before doing this the quality and thickness of the material surrounding the housing seat in the frame should be determined to make certain that the casting will have sufficient strength after reboring. Worn bolt holes and dowel holes in the frame should be welded and drilled.

In specifying allowances for the housing fit in the frame it is necessary to distinguish between box frame and split frame motors. The calipered dimension of the standard or oversize diameter of the housing seat in box frame motors should be within the limits of plus 0.00 in. to minus 0.002 in. of the nominal dimension. The necessary clamp fit in the housing seat of the split frame motor is obtained by placing single 0.017-in. liners at the split of the frame halves during machining and removing them afterward. With these liners in place the housing seat should be bored to standard or oversize diameter within the limits of plus or minus 0.001 in. of the nominal dimension. These allowances and variations should also be used for the bearing seat in the split frame motor without housings.



Housing and axle bearing seats in box frame motor

Worn housings which do not fit tightly in the remachined frame housing seat can be welded with little if any trouble except on housings of malleable iron. Sufficient material should be added by welding to finish the outside diameter on the housing to standard size or larger, depending on the bore of the housing seat in the frame with which it is to be used. Worn bolt holes, dowel holes or key seats in the housing should be filled by welding and remachined. Housings made from malleable iron or other materials can be repaired by shrinking on a steel ring. The housing has to be machined for the proper seating of the ring and the ring must be finished after it is shrunk on in place, the same as for the welded housings. If neither of these two methods is applicable, a new housing with standard or oversize frame fits is necessary. A worn oversize housing can be machined to standard size and used in a new, repaired or unworn frame housing seat.

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*This is the second of two articles on proper allowances and repairs to keep gear-center distance of railway motors accurate. In the first article, published in the issue of ELECTRIC RAILWAY JOURNAL for May 21, motors in service were considered and limits were given for wear.

The allowance for the frame fit on the housing is different for the various materials used in the housing and depends mainly on the strength and elastic limit of the material. The nature of the surface finish and size of contact area of the surfaces fitted together should also be considered. The allowances which will be given for different outside diameters are for malleable iron housings. The character of the surface finish is assumed to be the same as on new motor parts, i.e., a good average finish. The necessary allowances for a tight fit are as follows, considering the conditions outlined above:

	Nominal Diameter
(A) For housings used in box frames:	
Up to 7 in. diameter	+0.002 in. +0.004 in.
Above 7 in. to 21 in. diameter	+0.003 in. +0.005 in.
Above 14 in. to 21 in. diameter	+0.004 in. +0.006 in.
Above 21 in. to 28 in. diameter	+0.005 in. +0.007 in.
Above 28 in. to 35 in. diameter	+0.006 in. +0.008 in.
Above 35 in. to 42 in. diameter	+0.007 in. +0.009 in.
(B) For housings used in split frames:	—0.000 in. +0.005 in.

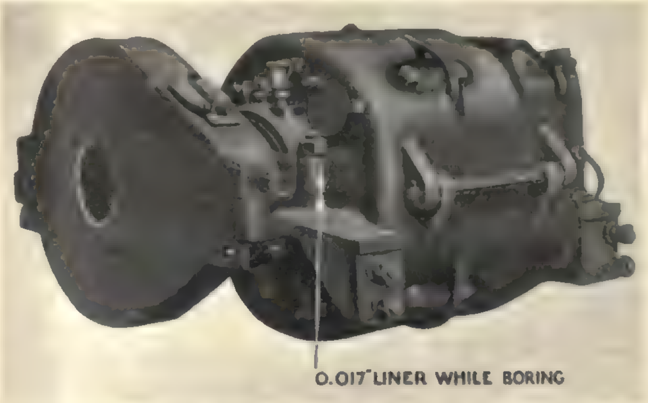
The above allowances are suitable for malleable iron. A smaller allowance is required for cast-iron housings, for a smoother finish and for a wider contact surface. Cast-steel housings, rougher finish or a narrower contact surface may require more allowance for press fit in box frame motors.

The following minimum and maximum allowances for malleable iron housings in box frame motors may be obtained:

	Minimum	Maximum
Up to 7 in. diameter	0.002 in.	0.006 in.
Above 7 in. to 14 in. diameter	0.003 in.	0.007 in.
Above 14 in. to 21 in. diameter	0.004 in.	0.008 in.
Above 21 in. to 28 in. diameter	0.005 in.	0.009 in.
Above 28 in. to 35 in. diameter	0.006 in.	0.010 in.
Above 35 in. to 42 in. diameter	0.007 in.	0.011 in.

A small chamfer on the housing and frame will assist the assembly of the housing with the frame.

Bolts holding the upper and lower halves of frame together provide the necessary clamp fit of the housing in a split frame motor. A gap of 0.016 in. minimum and 0.023 in. maximum between the two halves of the frame gives sufficient clearance that the clamping bolts can exert the necessary pressure on the housings at the frame seat.

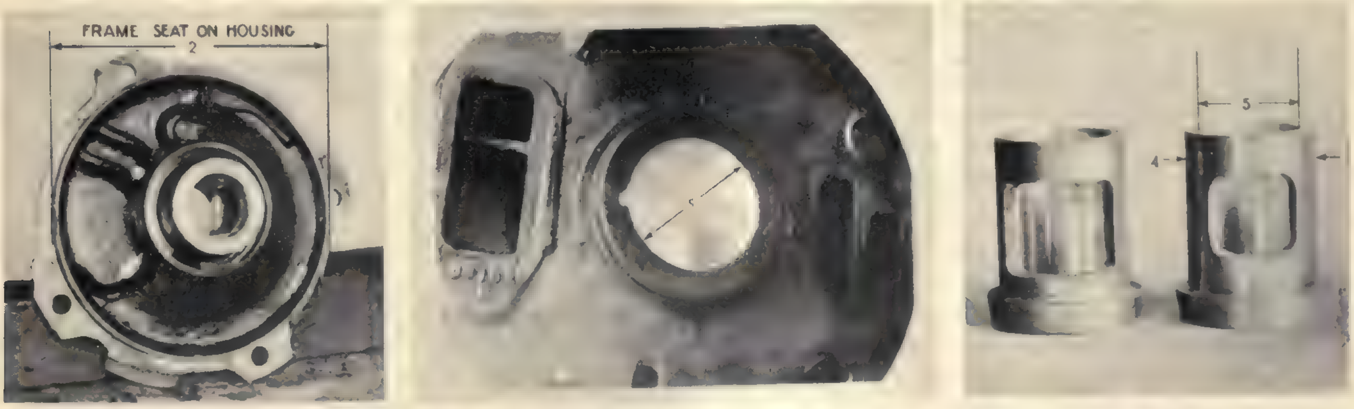


Housing fit in split frame railway motor

If a new bearing with standard outside diameter can be forced into a housing with a pressure less than 1 ton, the housing should be rebored to a diameter larger than standard and the keyway cut deeper. Housings with weak bearing seats should be scrapped if a safe press fit of approximately 5 to 8 tons is not needed to hold the bearing in place and new housings substituted.

In boring the housing for the bearing seat no allowance should be made. The standard or oversize bore should be machined to a diameter within the limits of ± 0.001 in. of the nominal dimension. The variations for the keyway in the bearing seat in the housings are — 0.000 in. to + $\frac{1}{32}$ in. above the nominal dimension for depth and — 0.000 in. to + 0.003 in. above the nominal dimension for width.

In order to obtain a good press fit of the bronze bearing in the housing with a pressure of approximately 3 to 5 tons, it is essential that the bearing be not removed from its seat unless it must be repaired or the armature end play adjusted. A bearing should not be returned to service if the pressure required to press it into the housing is less than 1 ton. Bearings with standard outside diameter which cannot be held in place in a new or repaired housing with at least 1 ton pressure should be scrapped and new bearings used instead. Bearings with oversize outside diameter should be machined to standard size if when forced into a rebored housing less than 1 ton pressure is needed. The new armature bearing should be finished on the outside to the nominal standard or oversize dimensions plus an



At left, frame seat on a housing. In center, armature bearing seat in housing. At right, armature bearing outside fit and bore. Bearing at right is an improved design of that shown at left in which the size and shape of the oil opening is changed to increase the press fit allowance for press fit of + 0.003 in. to + 0.005 in. The width of the keyway in the bearing should be machined to nominal dimension within the limits of + 0.000 in. to — 0.002 in. in order to have a tight fit with the key. The variation for the depth of the keyway is — 0.000 in. to + 1/32 in. The length of the keyway in armature bearings should be within the limits of — 0.000 in. and + 1/16 in.

Considering the variation on the finished bore of the housing and the allowance and variation on the finished outside diameter of the bearing, the minimum allowance above the metal-to-metal fit will be + 0.001 in. and the maximum will be + 0.005 in. This allowance will result in a press fit, as previously mentioned, of 3 to 5 tons, depending on the design of the bearing, thickness of bearing shell and size of oil opening. Bearings placed in split frame motors without housings are clamped in their seats by means of the bolts holding the frame halves together.

Shaft with armature bearing seats indicated

Axle with motor axle bearing seats indicated

As long as the bearing can be held in place with at least 1 ton pressure all the wear in the bore and on the face of the flange can be repaired by rebabbitting. The babbitt lining can be made thicker and bored to fit the standard or undersize shaft, providing the thickness of babbitt is less than the single air gap between armature and pole piece. An important advantage is incorporated in a bronze bearing shell when the thickness of the babbitt lining is smaller than the single air gap of the motor. In such bearings the shaft will run freely on the bronze shell if the babbitt melts and the armature core will not go down far enough to touch the pole pieces. This will enable the motorman to bring the car to the carhouse without holding up the traffic. If the babbitt melts when the lining is equal to or larger than the single air gap, the armature banding wire, the armature insulation, coils or even fans and other parts may be destroyed and the wheels locked.

The babbitt lining should be 1/16 in. thick in new bearings with standard bore, as well as in bearings with undersize bores for use with worn shafts machined smaller than standard, as 1/16 in. is the recommended limit of wear in a bearing bore if worn on one side. Operators with a few motors of one type may use new bearings with linings 1/8 in. thick if it is desirable to rebore the bearings for each individual worn shaft.

Excessive wear on the flange end can be compensated for by taking the bearing out of the housing and placing steel rings, each 1/16 in. thick, behind the flange so as to bring the total armature end play within allowable limits, which should be not less than 1/32 in. Babbitted bronze bearings should be bored with the following allowances and variations:

Nominal Bore	Allowances and Variations Before Pressing the Bearing Into the Housing
2 in. to 3 in. inclusive	+0.006 in. to +0.008 in.
Over 3 in. to 4 in. inclusive	+0.008 in. to +0.010 in.
Over 4 in. to 5 in. inclusive	+0.012 in. to +0.014 in.

Bearings should be finished on the thickness of the flange within the limits of plus or minus 0.005 in.

The repair on the bearing seat of the armature shaft goes hand in hand with the set-up made for the machining of the bearing bore. Operators with many motors have standardized on shaft sizes in steps of 1/32 in. or 1/16 in. diameter less than the original. They carry bearings in stock having finished bores in the same gradations. In such cases the shaft should be machined to the next smaller standard undersize diameter if it is worn 1/64 in. maximum on the diameter. This subject was discussed in an article, "The Use of Undersize and Oversize Armature and Axle Bearings," published in ELECTRIC RAILWAY JOURNAL, issue of April 18, 1925.

In modern commutating pole motors the bearing seat of the armature shaft should not be weakened more than 1/8 in. on the diameter. Even this margin has to be decreased for special light-weight motors or for shafts not made from the necessary high-grade material. Bending or breakage of the shaft causes trouble which is more expensive to repair than to supply a new shaft. Worn shafts machined down to the safe limit may still be used with a steel sleeve shrunk over the full length of its bearing seat. This steel sleeving can be machined to the standard diameter if it still possesses enough mechanical strength to be held tightly in place.

Operators with only a few motors of the same type should preferably true up the tapered worn shaft and bore the respective bearings to suit the new diameter. A steel sleeve could be shrunk on the shaft and the same procedure followed as that recommended when the shaft is worn to the safe limits. If it is worn beyond the safe limit the shaft should be replaced.

All standard and standardized undersize shafts should be machined to the nominal diameter, being finished at the bearing seat within the limits of + 0.000 to — 0.002 in. Using these limits, together with the allowances and variations on the bearing bores, the following minimum and maximum total clearance between the shaft and bearing bore will result for repaired motors, assuming that the bearing does not collapse when pressed into the housing.

Nominal Shaft Size	Clearance Minimum	Clearance Maximum
2 in. to 3 in. inclusive	0.006 in. to	0.010 in.
Over 3 in. to 4 in. inclusive	0.008 in. to	0.012 in.
Over 4 in. to 5 in. inclusive	0.012 in. to	0.016 in.

These clearances are also suitable for bearings bored to suit the worn shaft. The clearances are necessary to prevent collapse of the bearing when pressed into the housing and to compensate for some of the misalignment in the assembled motor. The housing fit in the frame and the bearing fit in the housing should be checked with care to insure that these parts are seated properly if the bearing pinches the shaft. The shaft dimensions should also be checked and it should not be allowed to be bent over a reasonable amount. Finally the clearance between bearing bore and armature shaft should be such that it turns freely in the bearing and establishes the necessary oil film.

Most axles must be replaced before they reach the point where the motor bearing seat would have to be machined as far down as ¼ in. smaller than standard, which is an average safe limit. Each individual case should be considered carefully as much depends on this particular part of the car equipment. Human lives are directly endangered and considerable damage may be involved if an axle should break on a car moving even at low speed.

The axle should be machined at the motor bearing seat to the next smaller standard undersize if the diameter is worn 1/32 in. maximum. This holds good only when it has been decided to carry in stock undersized axle bearings with bores in steps of 1/16 in. Otherwise the axle may have its tapered worn bearing seat trued up if other repairs make it possible to do this machining at reasonable expense.

The standard or standard undersize axle should have the motor bearing seat machined to the nominal diameter, being finished within the limits of + 0.002 in. and — 0.002 in.

The wear on the axle bearing bore or on the flange end can be repaired by babbitting the bronze bearing. Excessive motor end play on the axle should be compensated for by the adjustable axle collar. The width of the flange may be increased or material may be added to the wheel hub by welding or other means to bring the end play of the larger motors within the allowable limits. The motor end play should be not less than 1/32 in.

The standard bores and standard undersize bores of solid bronze or bronze babbitt lined axle bearings should be finished to the following allowance and variations:

Nominal Bore	Allowance and Variations
Bore up to and including 5 in.	+0.015 in. to +0.017 in.
Over 5 in.	+0.028 in. to +0.030 in.

The width of the bearing flange is to be finished within the limit of ± 0.005 in.

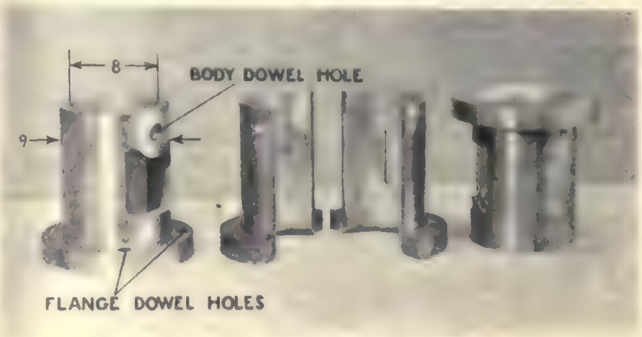
Considering these allowances and variations and the limits for finishing the axle on the motor bearing seat the following clearances between axle and bearing bore may be obtained:

Nominal Bore	Clearance
Bores up to and including 5 in	0.013 in. to 0.019 in.
Over 5 in.	0.026 in. to 0.032 in.

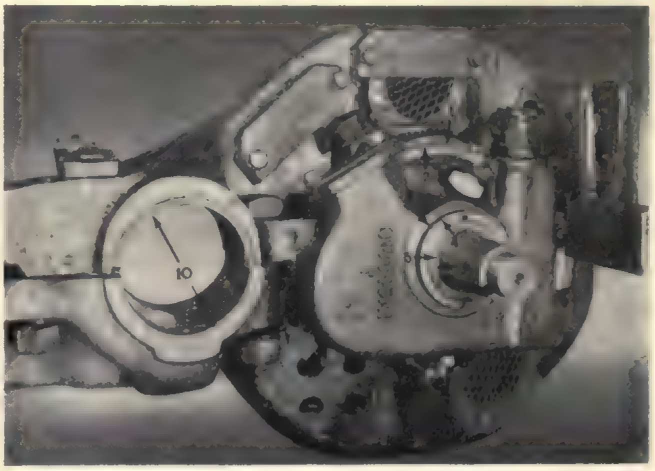
Clearances larger than those specified above should not be allowed. The clearances given cause the bearings to be clamped tightly by the axle caps of new motors, will not pinch the axle and will permit a sufficient oil film to build up around the axle in the motor bearings.

An axle bearing with standard outside diameter should be scrapped if worn on the outside to such an extent that it cannot be clamped tightly onto a new or repaired axle bearing seat. Repairs on the outside of axle bearings do not warrant the expense. An axle bearing with oversize outside diameter may be machined to standard and used on other motors if it cannot be clamped in the rebored bearing seat. Worn dowel holes or keyway of bearings should be welded up and redrilled or remachined. The allowance for clamp fit on the outside is — 0.000 in. to + 0.003 in. above the nominal diameter. Welded dowel holes in the flange should be drilled 1/32 in. larger, the body dowel on the flange end 1/16 in. and the body dowel on the end opposite the flange 1/32 in. larger than the respective dowel pins protruding into them. The limits for the keyway in the axle bearings are the same as for armature bearings except that the width of the keyway is to be machined within the limits of + 0.002 in. to + 0.005 in.

A worn axle bearing seat in the frame and axle cap should be welded. With sufficient material added, the bearing seat can be rebored to standard dimension the same as on the new motor. The original good clamp fit of an axle bearing can also be restored if sufficient material will surround the bearing by increasing the diameter of the bearing seat in the frame and axle cap ⅛ in., using a ⅛-in. oversize bearing. The worn bolt holes, dowel seats or keyways in the axle cap have to be welded up and drilled or cut new.



Outside and bore of axle bearings



Complete motor with wearing surfaces affecting the gear center indicated. Oil sealed housing is used on this motor to improve lubrication

When boring the frame and axle cap a single liner 0.017 in. thick is to be inserted in the split. Then the bearing seat should be machined to the nominal diameter within the limits of ± 0.002 in. Limits for the keyway in the axle caps are the same as those for the keyway on armature bearings. The key should fit tight in the axle cap.

With the liners removed from the split after reboring, the minimum gap provided for the necessary clamp fit with the axle cap bolts will be 0.015 in. and the maximum will be 0.019 in., considering the variations on the bore for bearing seat as well as the allowance on the outside diameter of the bearing. The above gap will leave sufficient space for correct adjustment of the clamp fit on new motors. Shims may be used to release the clamping action until the bearing is properly seated. With the different motor parts repaired and machined they will fit together the same as on new motors if the surfaces are machined smooth and gaged accurately.

In the foregoing discussion the repairs on the motor to provide correct gear-center distance have been considered. The subject has been treated as if the ten surfaces had reached simultaneously the limits described in the article in ELECTRIC RAILWAY JOURNAL, issue of May 21, or as if it had been necessary to repair all parts of a motor simultaneously.

It would be ideal if the repairs of all motor parts could be made after a set time, say 100,000 car-miles. However, as this very seldom happens, operators will ask the question: "How much may a motor part be worn before repair is necessary if the motor has been taken out of service for one reason or another?"

The motor may have reached the limit of wear for one of the ten surfaces while others are not yet worn down to the condemning limits. The above question can be answered only if extensive records of wear on each of the ten surfaces are available and then only for the road from which the records are taken. Generally all parts should be repaired which will reach the set limit of wear before the motor is again due for general overhauling.

It is, therefore, recommended that the necessary set-up be made for a record for the amount of wear of the different surfaces in one overhauling period. This period should be established after giving consideration to the wear on all details of the car equipment. Records should be kept of the wear of motor parts, control equipment, braking equipment, trucks, wheels and car body. For all of these parts, limits or a definite life should be set first. The general overhauling should be made so that it meets with the time at which the most parts demand repair or scrapping.

Parts which need repair previous to the set time should be improved in quality so they can wait until the car is overhauled. Parts which have a longer life should either be improved or reduced in quality until they last a multiple of the overhauling period. Considering the ten surfaces to wear on the motor the operator can assist the manufacturer to improve motors in service and to design new motors. All motor parts would have to be considered, such as the commutator wear, brush-holder wear, fatigue of armature leads, the wear on field coils, gear, pinion, gear case and other parts subjected to wear.

The wear on the different motor parts in a given time will depend to a large extent on the kind of attention the motor will receive. The wear in the bearing, for example, will be less with better lubrication and with better oil. The wear will depend also on the sand condition of the road and the protection given the bearings against admission of sand, water or other foreign substances. The commutator, brush-holder and carbon wear depend also on the protection against sand. All these factors are different for various roads and motor designs. The amount of wear can, therefore, be obtained only by experience.

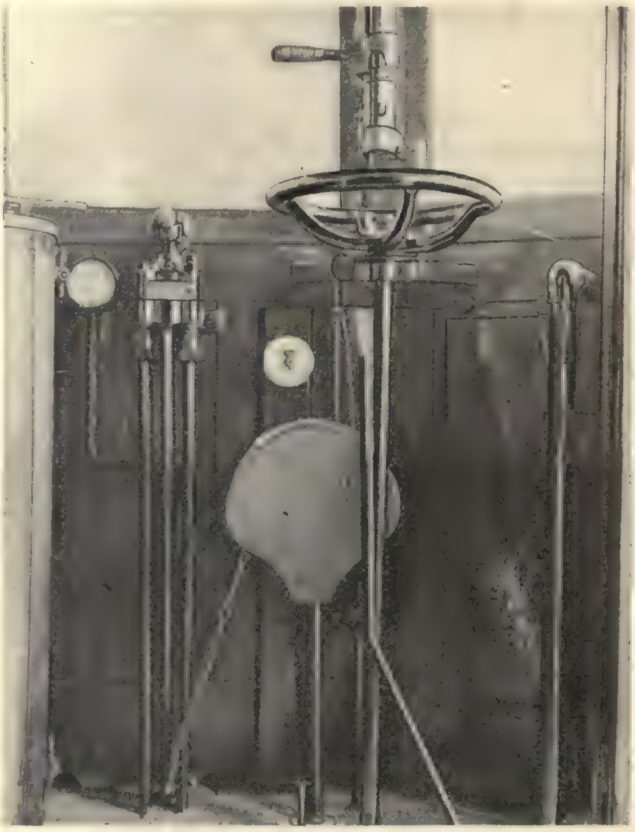
Protection adapted to special conditions can make the life of the motor parts fairly uniform for the different roads. Dust cap brush-holders, for example, will lessen wear on carbons, brush-holders and commutators, especially on sandy roads. New type dual ventilation likewise reduces this wear. Deep oil well covers and oil sealed housing will prevent admission of foreign substances into the bearings.

Records will show the weak parts and perhaps suggest a remedy. As soon as some sources of failure are eliminated more attention can be paid to the remainder. The number of failures will reach the minimum. All parts will then wear so that they require repair at the same time. The whole car and its equipment can be stripped down, cleaned and repaired at one time, thus reducing considerably the cost of maintenance. All parts will be brought up to previous standard and the equipment of today will be the same as at the time when it was new.

This program requires a careful study of all parts for two years or longer. Such a combined effort by all operators will bring the electric railways ahead of the steam roads and the nation ahead economically.

Motorman's Stool Chained to Platform

ON A NUMBER of double-end cars of the Connecticut Company two motormen's stools are provided, one at each end. These are fastened by chains to the floor, in such a manner that when not in use they can be set in a receptacle out of the way. This arrangement permits free movement of the stool to any desired position on the platform but prevents its removal from the car. Replacement of stools has been eliminated by this device and every motorman is sure of finding one on any car to which he may be assigned.



On this car of the Connecticut Company a stool is provided at each end for the motorman and fastened by a chain to the platform floor

An embankment 40 ft. high was required to get sufficient clearance under the steel bridge that carries the new cut-off from West Junction over the Chicago & Northwestern Railway tracks

Milwaukee Completes Important Rapid Transit Link

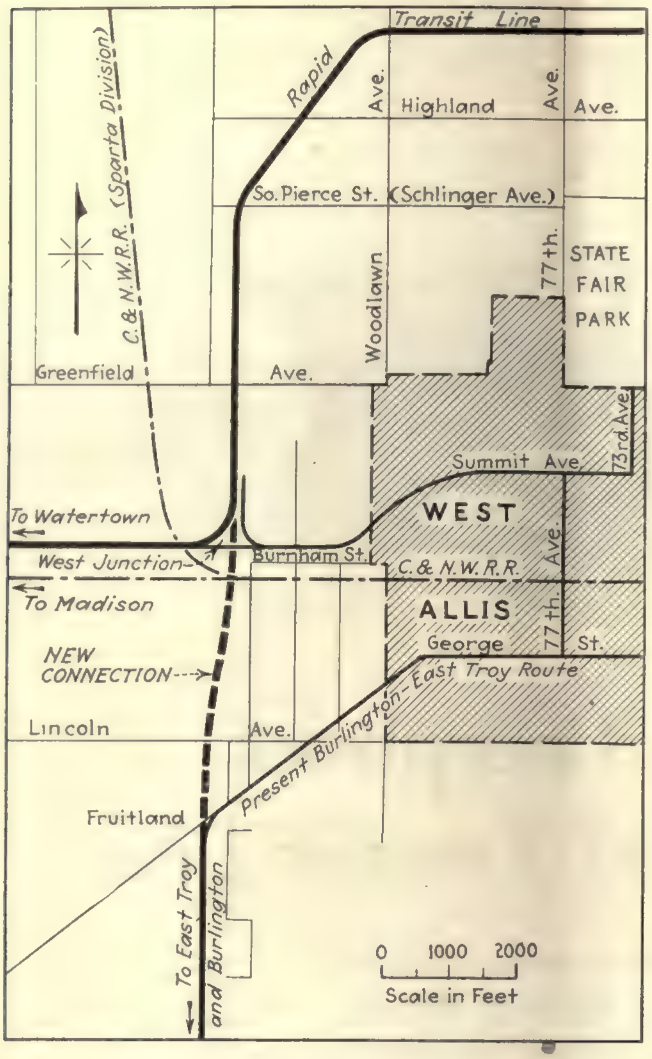
Twenty-three minutes running time to be saved between terminals on Burlington-East Troy line by the new cut-off

COMPLETION of a new cut-off 6,500 ft. long between West Junction on the Waukesha-Oconomowoc-Watertown line and the intersection of 93d and National Avenues on the Burlington-East Troy line of the Milwaukee Electric Railway & Light Company is the final step in the construction of a system of rapid transit entrances to the city for that company's interurban lines from the west and southwest.

Trains on the Watertown line have been operating for a year over the rapid transit private right-of-way that extends from West Junction to 36th Street on a solid embankment fill entirely free of grade crossings except between Hawley Road and 68th Street, where a right-of-way had been acquired and grade separation work will be under way this summer. Completion of the new link from West Junction to the East Troy-Burlington line will permit high-speed trains on these two divisions to be brought into the downtown terminal over the same route as those from Watertown. This will eliminate running along the congested National Avenue highway and busy West Milwaukee and West Allis Streets and effects a saving of 23 minutes running time from the former schedule.

Although only a mile long, the new link includes a wide range of construction work. Starting south from West Junction it ascends on a 3 per cent grade on a heavy fill which reaches a height of 40 ft. At this point it crosses the Wells-West Allis line of T. M. E. R. & L. Co. and the Sparta division and Madison division of the Chicago & Northwestern Railway on a steel viaduct 283 ft. long. A clearance height over the railroad of 22½ ft. is maintained. Here the track is carried over a piece of swampy land on a timber trestle 418 ft. long. The grade descends at 2.633 per cent and enters a cut approximately 1,100 ft. from the south end of the viaduct. This cut then extends for 1,900 ft., the track

One of the five new automatic substations on the Burlington-East Troy line. St. Martins, which is illustrated, is a two-unit station



The new connection is a strategic link between the rapid transit entrance to the city and the East Troy-Burlington interurban line. A saving of 23 minutes in running time is thus made possible

passing under a steel highway bridge at Lincoln Avenue, then emerges on a fill and rises on a 1.55 per cent grade to another steel bridge over National Avenue and drops down on a 1.552 per cent grade to join the present Burlington-East Troy line tracks at grade. A total of 135,000 yd. of earth was moved in the grading and approximately 400 tons of steel went into the bridges. The bridges and cuts are wide enough for double track, although the cut-off will be operated single track until additional construction is justified. Eighty pound A.S.C.E. rail on Sellers tie plates is carried on 8-ft. cedar ties and ballasted with crushed rock from the company's quarry on the Milwaukee Northern line. Construction was started on March 3 of this year and the new cut-off is expected to be open for regular service on June 20. The line is to be fully protected by a Nachod signal system.

Trolley voltage on the Burlington-East Troy line is being changed from 1,200 to 600 volts, in line with the company's standard on the remainder of its interurban system. Five automatic substations are being installed at Mukwonago, Chamberlain, St. Martins, Wind Lake and Waterford. St. Martins is a two-unit station, the others being single. A new 26,400-volt transmission line was erected between St. Martins and Mukwonago, a distance of 15 miles. The substation buildings are of simple but neat appearance as shown in an accompanying illustration.

Chicago Rapid Transit Insures 5,683 Employees

EMPLOYEES of the Chicago Rapid Transit Company, Chicago, Ill., are insured to the extent of $10,595,000 with a maximum protection of $20,445,000 under a group plan put into effect in December, 1926. Each of the 5,683 employees is furnished with double accidental death insurance in the sum of $1,000, while health and accident insurance providing compensation as high as $20 a week for 26 weeks has been provided for any one disability in any one year.

A steel bridge over the highway at Fruitland is at the southern end of the new cut-off

You Can't Sell Cotton Goods in a Silk Age*

By Charles Gordon

Editor *Electric Railway Journal*

NOW, of course, you are not in the business of selling cotton goods. You are supposed to be in the business of selling transportation. And so, this subject would have been more specific if it had said, "you can't sell uncomfortable seats in clumsy, unattractive, lumbering cars in this age of air-cushioned upholstery, stream lines and pneumatic tires."

But I like the expression, "You can't sell cotton goods in a silk age." It isn't original with me. It was used by a prominent railway executive who is given to doing unusual things and using unusual expressions. This phrase is used merely as a figure of speech, but it puts into a few words a colorful summary of what I consider the best thinking on the present electric railway situation.

The industry is talking a great deal today about merchandising transportation. That is a nice sounding phrase. We are all using it. But our industry has a tendency to use such expressions as this without thoroughly realizing their significance. I doubt if there are many railway men who do not feel that they are taking every reasonable step to merchandise their service. And yet, I venture to suggest that most of the industry isn't even scratching the surface of the possibilities in this direction.

Stop trying to screw your service down to the limitations of a split penny fare. Give your riders a taste of really modern transportation and all the politicians in town can't keep you from getting the proper fare to support it.

Take this merchandising idea and hang onto it for a moment. Stop using the words merely as a trite, smooth-sounding phrase. Let's dig into this thing a little bit and see where it leads and what it demands.

ARE TRAINED AS OPERATORS

If we are trying to sell cotton goods in a silk age we are poor merchants. The first principle of merchandising success is to provide a product that the customer will buy. If electric railway men have erred here it is not surprising. They were not raised as merchants. Their training is that of operators. In the past we have been manufacturers of the product known as public transportation. Our experience was obtained in days when the customer had no choice but to use our service. And so our entire attention was devoted to providing that service as economically and as efficiently as possible.

As transportation operators, electric railway men don't need to take off their hats to anybody. They have provided local transportation under conditions that almost defy arithmetic and make two and two equal five.

When the cost of labor and material was doubling, when the prices of all products that the industry buys were advancing by leaps and bounds, when every element that goes into the cost of local transportation acted as though it was hitched to the end of a skyrocket, the rate of fare remained practically constant for years and then slowly rose to a figure which is now only a ridiculously small amount above that before the war.

This was, however, by no means the limit of the electric railway man's accomplishments as an operator. The industry's credit went to pieces. Still he had to carry on—and he did carry on in a manner to his everlasting glory. Without money for improvements, with an unfriendly public, and with his own employees inclined to kick him when he was down, with his back against the wall, the electric railway operator managed to carry on.

I am impatient with a recital of the industry's burdens and troubles. I give you this brief review of the conditions encountered by most of the properties in this country merely to illustrate some of the operating difficulties that have been successfully overcome. I haven't given you a list of all the difficulties. It took strong hearts to carry on. The situation looked, many times, to be impossible of solution. The industry seemed doomed. It isn't surprising that some weakened and doubted. During the very period when all these troubles were piling up, the greatest single menace of all to the public transportation industry was gaining momentum by leaps and bounds. The automobile entered the picture. The country took to rubber tires. Then the sages began freely predicting that the end of the local transportation industry had come. First in the hands of its owners, then as a jitney, and finally in the form of a bus, the automotive unit on rubber tires threatened for a time to take away the patronage—and did take a lot of it—from the income-restricted, expense-ridden local transportation companies.

But they carried on. They had an obligation to their communities and one to their investors. They continued in the face of overwhelming odds to operate as best they could. They trimmed expenses, and then trimmed again. Even when L. F. Loree, president of the Delaware & Hudson Railroad, was saying that the country could wipe off its books the $6,000,000,000 invested in the electric railway industry, that industry was already turning the corner toward improvement!

Oh, yes! As transportation operators electric railway men are entitled to the admiration of the business world. They have continued to produce a ride for little increase in price when every element entering into the cost of that ride has increased enormously.

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*Address delivered before annual meeting of the Mid-West Electric Railway Association, St. Louis, June 9-11.

I didn't start out here to pat electric railway men on the back and tell them how good they are. Some of them know me better than that and know that I am prone to criticise. But I hope that my criticism is friendly criticism—that is what I always intend it to be. Friendly criticism, constructive criticism, is good for any of us. I'll try not to disappoint you in that direction before I finish. But I want to get this picture of the industry balanced. I want to add another word or two on the credit side of the ledger.

Even while you were staggering under discouraging burdens—and some of you are still doing so—the measures that were introduced for economy and the improvement of service were blocked nearly every step of the way by short-sighted politicians and selfish labor. When the transportation ship was in imminent danger of foundering under the unbalanced relation between income and expense, the one-man car was conceived. This was merely a step in the direction which has brought America the industrial supremacy of the world. Mechanical safety devices were introduced to do the work formerly done by human mind and muscle. Machine labor was substituted for hand labor and the resulting economies made it possible to furnish more service at less cost than formerly.

You can't merchandise an inferior product — if you expect to stay in business in one town very long. Your product consists of your cars and the manner in which they are operated. After all, that's all you have to sell.

But in many places the improvement was bitterly opposed. Men thought their jobs were in jeopardy. Despite the fact that it was repeatedly demonstrated that the natural turnover of labor takes care of the reduced manpower required as one-man cars are introduced, they were doggedly opposed and are still being opposed in some places. I know of no city in which the introduction of one-man cars threw men out of work. But I know many cities where it brought them increased pay. I know also that it helped to save many an electric railway job, for without the one-man car many properties that are now rendering efficient service to their communities would have found it impossible to survive.

And so I repeat that as transportation operators you have justifiable cause for pride. In the face of all these difficulties and obstacles you have in large measure—most of you—lived up to high ideals of public service and have provided transportation to the millions with a full sense of your responsibilities.

MEETS A NEW CHALLENGE

Here the industry meets a new challenge. This public of which we speak so much has changed. Its habits have changed. Its demands have changed. Particularly is this true as regards transportation. Speed, convenience, comfort, luxury! That is what today's public wants, and there are 20,000,000 automobiles in the country to prove it!

"The automobile is expensive," you say. Yes, that is true, but there have been 20,000,000 of them sold in this country and nobody has found the saturation point yet. What is the significance of this? Doesn't it give the key to your merchandising situation? Doesn't it mean that the first principle of selling to the American public—or to any public, for that matter—is to make the product fit the demand? Price is a consideration, but it is a secondary, rather than a primary, one. Of course, there have been more Fords sold than there have been Packards. I'll venture the guess, however, that there are many more low-priced car owners straining their resources and sacrificing other comforts and even necessities to operate their machines than there are larger car owners in that situation. Consequently the small cars are a luxury for a large part of those who buy them. I could continue to go on in this strain. I could point to the percentage of automobiles that are sold "on time" as an indication of the financial strain which people are willing to endure in order to have speed and luxury in travel.

Please do not misunderstand me. I am not deprecating the automobile a particle. I don't think the country is going to the everlasting bow-wows because people have taken to spending their incomes on rubber and gasoline instead of other things that might have been worse. If you are tempted in that direction please remember that the savings bank deposits in this country have been built up to an astounding level. Right here it may also be worth adding that there seems to be a significant relation between this fact and the fact that the savings banks have taken to merchandising their own service intensively.

The automobile has contributed much to this country, and I am not one of those who have any idea that it should be legislated out of business or taxed to death because it carries passengers who formerly rode on street cars. In fact, the automobile has enormously increased the riding habit of the people of this country. I am inclined to believe that once we learn how to bring our service up to the level of the popular demand and at the same time learn how to merchandise it intensively, the automobile, through this increased riding habit which it has produced and through the fact that it has brought us up on our toes because of the very necessity of self-preservation, will have proved a blessing in disguise to our industry.

Rapid increase in the number of automobiles in cities will lead to great curtailment of the individual's unrestricted right to use the streets. When the number of individuals who want to use the streets becomes such that they automatically interfere with each other's rights and cut down the usefulness of the existing street facilities, then the rights of the individual must give way to the needs of the community. The right to use the streets for pleasure must give way to the uses of business and necessity. I don't believe the street car has any greater right to the use of the streets than have I in my automobile, except that it serves the needs of 75 per cent of the people, while I serve only my own convenience. As the agency for transporting 75 per cent of the people who use the streets, the public vehicle, in the name of its riders, is certainly entitled to a proportionate consideration in the regulation of street traffic. Only in the interests of its riders does it claim and is it entitled to special consideration.

Public officials are prone to be confused between the number of vehicles and the number of riders using the streets. Since the car rider is largely inarticulate and unorganized the responsibility for protecting his interests rests on the railway management. Courageous discharge of that responsibility is a public service of the highest order.

Now let's get back to merchandising. Those 20,000,000 automobiles that I mentioned a moment ago illustrate what can be done in merchandising a product which fits the public demand, even when the price of the product is a severe strain on the family purse. As transportation men, we know all about operation—that is to say, we know all about manufacturing the product—furnishing the service. But for the first time in the local transportation industry a new element has come into the situation—the need for selling the service that we formerly provided free of competition. For the first time in their experience transportation men are faced with the problems of merchandising and here their experience is very limited.

The problem is complicated by the fact that transportation men must not only take to selling their service for the first time, but the character of the demand in transportation has changed. This is indeed a silk stocking age. If there are any doubts in your mind ask the cotton mill owners of New England—or use your eyes on the street. When the shop girl will spend $2 for a pair of silk hose out of her limited income, surely price is a secondary consideration if you can make the public want a product badly enough. The industry has been concentrating on economy. It has been splitting pennies. It is only beginning to take in hand seriously the study of the quality of its product.

Of course you have been expecting me to get around to the subject of modern cars and I am not going to disappoint you. But I want to talk cars from just a slightly different angle for a moment. Permit me to repeat something that I have said several times before. Improved cars are not a panacea. They are not a substitute for good management. They do not eliminate the need for concentrated, intelligent, persistent, merchandising effort. But they are a part of good management, and they make it possible for merchandising effort to be effective. You can't merchandise an inferior product—if you expect to stay in business in one town very long. Your product consists of your cars and the manner in which they are operated. After all, that's all you have to sell.

I have been accused of advocating the "dolling up" of cars beyond the limits of practicability. I don't think it is necessary to have a lot of "gimcracks" on cars. I think many of the circus stunts are mere passing phases. They are good because they attract the attention of the public. Anything which will interest the public in the street railway situation—favorably, of course—is justified. Car improvement will ultimately settle down to perfection of design in the direction of appearance, performance and appointments, while at the same time remaining within the limits of reasonable maintenance and operating cost. There is, however, still a wide open field ahead.

MAKING RAPID PROGRESS

As we survey the electric railway situation today it is evident that the industry is moving forward very much more rapidly than some who are close to its daily routine may perhaps realize. When we consider the progress which has been made in any one of half a dozen cities that readily come to mind we are brought face to face with the complete reversal of outlook which has taken place in a very short period of time. Unless the developments are viewed in perspective the rapid change is not easily apparent. In a sense, it is like watching one's own offspring grow up. We are so close to them that they have blossomed into manhood or womanhood before we realize it.

There is no question but that the electric railway industry has definitely turned the corner and is moving forward rapidly to complete recovery and expanded usefulness. I am afraid, however, that there is still in the minds of some managements a lack of confidence in their own industry. I heard a speaker at a recent meeting, in endeavoring to illustrate the need for confidence and enthusiasm in winning success, say, "The bigger the IF on the clubhouse door, the lower the score." Spirit and confidence are as important in business as they are in sport. A little more push, a little more spirit, a little more optimism, a little more of an open mind regarding the possibilities of applying ideas developed by the other fellow, a little more enthusiasm and confidence in the possibilities of our own business are all that is needed.

President Sawyer aptly said recently: "This is a new day. The methods of the past will not suffice to meet these present-day conditions. Every precedent and practice that we have built up over these many years is subject to question." Every progressive railway man must agree with him heartily. I only add, "this is a silk age." Get the cotton goods off your shelf; make it your business to determine the kind of a product your customer wants and then sell it. Stop trying to screw your service down to the limitations of a split penny fare. Give your riders a taste of really modern transportation and then all the politicians in town can't keep you from getting the proper fare to support it.

Here the industry meets a new challenge. This public of which we speak so much has changed. Its habits have changed. Its demands have changed. Particularly is this true as regards transportation. Speed, convenience, comfort, luxury! That is what today's public wants, and there are 20,000,000 automobiles in the country to prove it!

A. TAURMAN

Wins Monthly Prize for May

Application of Alemite lubricating fittings to Brill half-ball brake hangers is awarded first $25 monthly prize in "Electric Railway Journal" Maintenance Contest. J. E. Blaiklock receives honorable mention

AT A MEETING of the judges in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition, held at the American Electric Railway Association headquarters, New York City, on June 8, it was decided to award the $25 monthly prize for May to the article describing the use of Alemite grease fittings to half-ball brake hangers. This article was submitted by A. Taurman, superintendent of equipment, way and structures Birmingham Electric Company, Birmingham, Ala.

All of the seven articles which were published in the Maintenance Data Sheet section of the May 21 issue were given careful consideration by the judges, and in addition to awarding the $25 cash prize, it was decided that the article describing a "Parawax Method for Determining Flange Wear of Wheels" should receive honorable mention for its usefulness. This article was submitted by J. E. Blaiklock, master mechanic Washington Railway & Electric Company, Washington, D. C. The use of this method takes the determination of flange wear out of the guessing class and places it upon a permanent record basis.

The practice of lubricating half-ball brake hangers through the use of Alemite fittings, as described in the May 21 issue, is an application of a method used quite universally on automotive equipment. In the original design of brake hangers excessive wear results from the difficulty of keeping them lubricated. Reduction of wear in this type of brake hanger is very important since looseness results in misalignment and reduced efficiency of the braking system. The use of the Alemite fittings by the Birmingham Electric Company has doubled the length of life of the hangers. The ease with which lubrication can be carried out after the fittings are applied insures that they are lubricated regularly. The method has resulted in a considerable decrease in the noise from trucks equipped with this type of brake hanger, and this subject is one which is receiving particular consideration by all electric railways at present.

Mr. Taurman became superintendent of equipment for the Birmingham Railway & Light Company in October, 1919. His railway experience began in the mechanical department of the Southern Railway at the Richmond shop, Richmond, Va., in 1901, where he served as machinist apprentice, shop foreman and mechanical draftsman. On leaving the Southern Railway he was connected with the American Locomotive Company as assistant resident inspector of locomotives at the Richmond Works.

In 1907 Mr. Taurman severed his connections with the American Locomotive Works to accept the position of mechanical draftsman with the New York Air Brake Company at Watertown, N. Y. In February, 1908, he returned to Richmond and entered the service of the Virginia Railway & Power Company, serving as a machinist, carhouse foreman and master mechanic. In 1913 he was promoted to superintendent of equipment in charge of all rolling stock and shops of the Virginia Railway & Power Company in Richmond, Norfolk and Petersburg.

A. TAURMAN

Mr. Taurman is secretary of the Association of Equipment Men, Southern Properties, is a member of the American Society of Mechanical Engineers and has served on the equipment committee of the American Electric Railway Engineering Association. As an electric railway man Mr. Taurman has given considerable attention to mechanical improvements, not only in rolling stock but also in various track and way construction.

IN THE PAGES of the Maintenance Data Sheet Section in this issue will be found another group of articles submitted in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition. One of these will receive the monthly prize of $25 for June. A considerable amount of material has been received so that space limitation prevents publication of it all at this time, but groups will appear in the issue of ELECTRIC RAILWAY JOURNAL devoted to maintenance and construction, which is the third issue published each month, and monthly prizes will be awarded as the articles are published. All material submitted has been of a very high class, and many comments have been received as to the value of the practices described. Several electric railway master mechanics have adopted them already and they should result in particular benefit to these systems and tend to the development of similar practices elsewhere. Full information regarding the rules for the contest was given in the April 16, 1927, issue of ELECTRIC RAILWAY JOURNAL, pages 700-701, and condensed rules and instructions for the contest have been published each week since.

Electric Railway Journal Maintenance Data Sheet

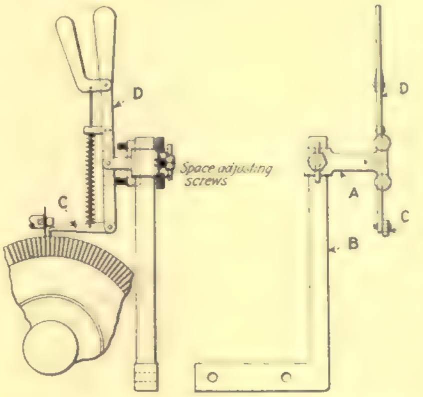
ROLLING STOCK—ELECTRICAL—15

Commutator Bar Spacing Attachment for Slotting Machine*

BY CHARLIE HERMS
General Foreman San Diego Electric Railway, San Diego, Cal.

FOR locating commutator bars properly while under-cutting the mica, a convenient bar spacing attachment is used in the shop of the San Diego Electric Railway. It consists of an upright arm, designated as *B* in the accompanying illustration, which is bolted to the side of the slotting machine opposite the commutator. The dimensions for this arm will vary with different machines, but the upright arm should not be less than ¾ in. round stock to prevent springing.

A sliding bar, designated as *A* in the illustration, slides up or down on the upright arm *B* and holds the pawl-locking mechanism. When adjusted to the proper position, depending on the size of commutator to be slotted, the bar *A* is held in place by a locking screw. The pawl *C* should be long enough to reach to the top center of the commutator and the slot engaging point should be thin enough to enter the slot cut by the saw. It should also be low enough to pass underneath the saw spindle nut as shown in the illustration.



Commutator-bar spacing attachment for slotting machine

In our shop it is the practice to saw one or two slots by locating the bars by hand and then adjust the attachment to the proper height and pitch for the commutator. When once adjusted, the lever *D* is pulled back until it strikes the top space adjusting screw. The pawl *C* is then lifted so as to be free from the commutator and the lever is pushed forward until it strikes the bottom space adjusting screw. The adjusting screws are set so that the pawl moves but one bar and locates the next slot directly underneath the saw.

The lever must not be operated too rapidly as there is danger from the momentum of the armature tending to revolve and so pass the slot, in which the pawl is to engage. A little practice by the operator will enable him to maintain a maximum speed of operation and get the best results.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

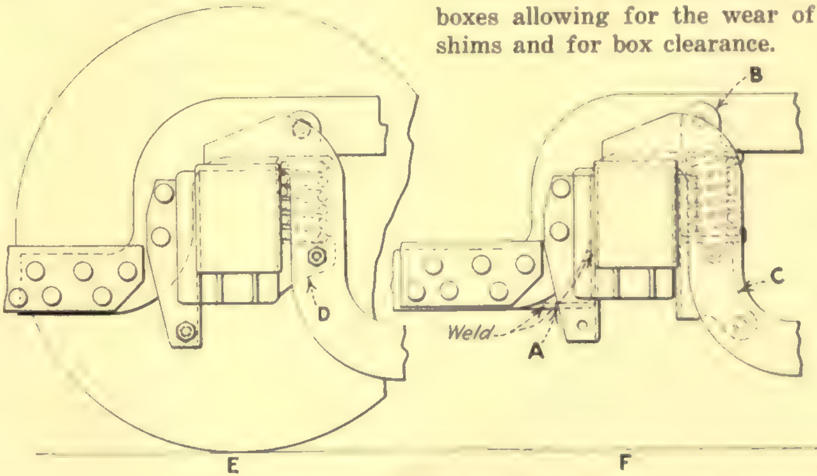
ROLLING STOCK—TRUCKS—9

Changes Reduce Truck Breakage*

BY EDWIN R. CLARKSON
Foreman Equipment Department, United Electric Railways, Providence, R. I.

DUE to excessive breakage of standard 0-50 truck frames at the point *D* shown on the accompanying drawing, changes in the method of supporting the frame on the journal box were made. A continual strain was produced at the point where breakage occurred, due to loosening of the bolts through this section. This caused wear and enlarged the holes in the equalizing bars, and the pressure of the brakeshoes against the wheels caused the bolt to act as a swivel to bring excessive pressure against the wear shim, which has no backing. The shim was held in place by two rivets. These wore through and broke.

In the accompanying illustration the sketch at the left shows the truck frame as originally constructed. The section at the right shows the changes that were made. A steel casting, *C*, bolted between the equalizing bars by finished bolts pressed into the casting was substituted for the lug of the journal box. These held the casting in the same relative position as the old lug on the box. The upper spring seat casting indicated at *B* was offset ⅜ in. to line up with the casting between bars, and a forging was welded to the side frame at *A* to provide a solid backing for the pedestal wear shim. The thickness needed was determined by measurements from the center line of the truck frame over the journal boxes allowing for the wear of the shims and for box clearance.



At left, original construction. At right, as changed

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

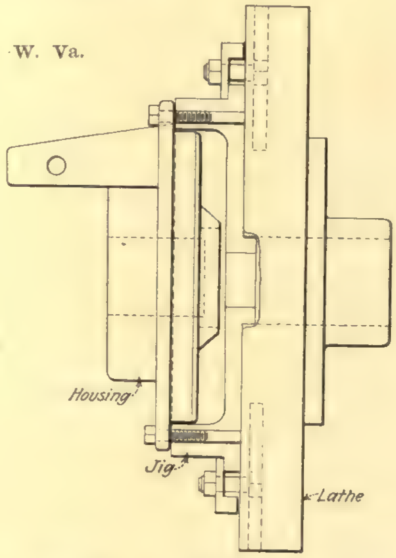
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—16

More Perfect Alignment Results from Boring Armature Bearings After Installation in Housing*

BY J. A. DUFFY
Superintendent of Equipment
Monongahela West Penn Public Service Company, Fairmont, W. Va.

THE method of finishing armature bearings used on our system is to finish the armature bearing on the outside, then press it into the housing and bore to the proper size for the shaft bearing fit by means of a special jig. The jig is arranged to fasten to the lathe face plate and the housing is bolted to this for the boring operation. Through the use of this practice we have obtained an increase of from 30,000 to 40,000 in the mileage of our armature bearings, particularly on the small Westinghouse 506 motors. On larger motors there has been a much larger increase in mileage obtained. The increased service results from having more perfect alignment of the bearings so that less wear results.



Assembly of Westinghouse type 306 CV4 motor housing with jig for boring out the bearing

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*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

Electric Railway Journal Maintenance Data Sheet

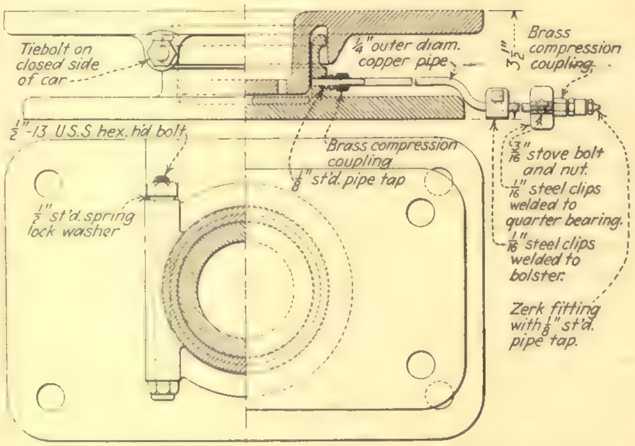
ROLLING STOCK—TRUCKS—10

Simplifying Lubrication of Center Bearings*

BY H. S. WILLIAMS
Assistant Superintendent of Equipment
Department of Street Railways, Detroit, Mich.

THE lubrication of truck center bearings has proved somewhat difficult of accomplishment due to their inaccessibility. The most common practice is to jack up one corner of the car and apply the lubricant with a gun or similar means. Often the center bearings are lubricated only when a pair of wheels are changed or some other repair is made which necessitates jacking up the car body. It is believed that in order to be effective the lubrication of these bearings must be made easy and so adapt itself to routine periodic treatment.

With this thought in mind the Department of Street Railways, Detroit, Mich., has developed a method of lubrication that is believed to meet all of the requirements of ease of operation and effectiveness. This consists in the equipment of the lower half of the center bearing with a copper tube that leads outward to the extreme end of the truck bolster. This outer end of the tube is fitted with a Zerk fitting. Consequently all that is necessary to apply the lubricant is a Zerk gun. The simplicity of the operation is obvious. In this particular design of the center bearing, a central chamber is provided with holes leading to the bearing surfaces so that any excess of grease or oil will tend to flow into this chamber and thus give the added advantage of an oil reservoir so as to retain the lubricant.


Tiebolt on closed side of car
$\frac{1}{4}$" outer diam. copper pipe
$3\frac{1}{2}$"
Brass compression coupling
$\frac{1}{2}$"-13 U.S.S hex. hd bolt
Brass compression coupling
$\frac{1}{8}$" st'd. pipe tap
$\frac{1}{2}$" st'd. spring lock washer
$\frac{3}{16}$" stove bolt and nut.
$\frac{1}{16}$" steel clips welded to quarter bearing.
$\frac{1}{16}$" steel clips welded to bolster.
Zerk fitting with $\frac{1}{8}$" st'd. pipe tap.

Method of applying Zerk fitting for lubrication of center bearing

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*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

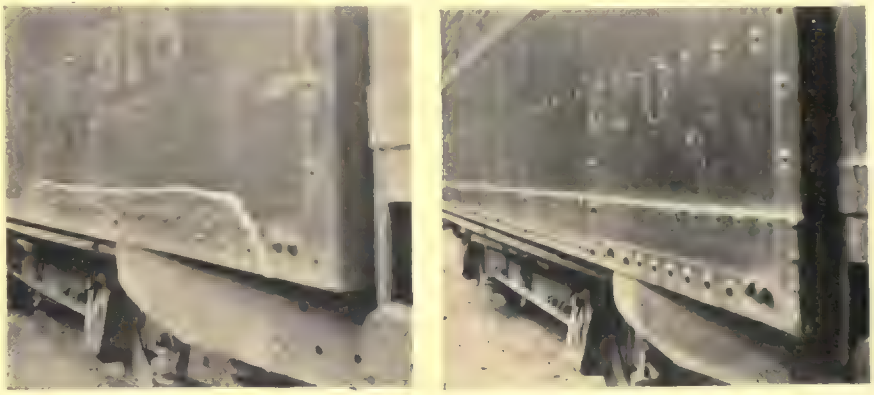
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—CAR BODY—1

Repairing Steel Side Sheets of Cars*

By R. T. Chiles
Master Mechanic Cumberland County
Power & Light Company, Portland, Me.

SOME time ago the Cumberland County Power & Light Company was confronted with the problem of repairing the side sheets of certain standard Birney cars. The side sheets were rusted through just above the top edge of the angle forming the side sill and the bottom side of the floor. The entire renewal of the side sheets would entail heavy expense and so some satisfactory method was sought which would not mar the looks of the car and still not be too expensive. It was decided to install additional steel plates running the length of the car, as shown in one of the accompanying illustrations. In practice, two different sized plates are used; one is ⅛ in. by 4½ in. wide and the other $\frac{3}{16}$ in. x 6 in. wide. The narrower plate is used where side sheets are rusted through below the bottom side of the floor. This size is less expensive to install and can be put on without removing any of the inside trim. The larger size is used where the side sheet is rusted through above the bottom side of the floor. To attach it the base boards on the inside of the car have to be removed. The method of installing these plates consists of removing rivets that hold the bottom edge of the side sheets to the angle side sill. The plate is marked off from these holes and is drilled for ⅜-in. x 1-in. carriage bolts. The top edge is drilled for ¼-in. by ¾-in. stove bolts, holes being spaced on 2-in. centers.



At left, side sheet of car which has rusted through. At right, car repaired by installing a narrow plate along the bottom edge of the car

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

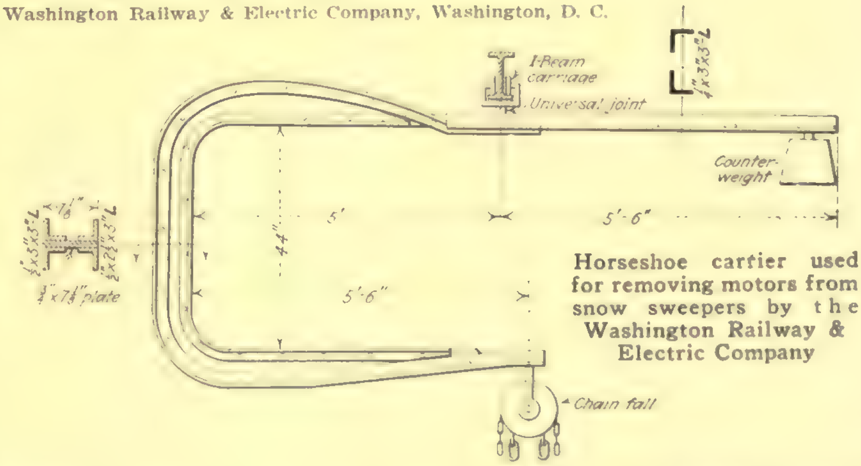
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—1

Carrier for Removing Broom Motors*

By J. B. Blaiklock
Master Mechanic Washington Railway & Electric Company, Washington, D. C.

REMOVAL of broom motors from inside snow sweepers is a difficult and expensive job unless special provision is made for easy handling of the equipment. To meet this condition the Washington Railway & Electric Company, Washington D. C., in its truck shop uses a horseshoe shaped carrier beam, as shown in the accompanying sketch. This carrier is suspended on an I-beam carriage by means of a swivel joint, the I-beam running at right angles to the tracks in the shop so that the carriers can be run with the long extension over the top of the car and the short extension inside the car.



Horseshoe carrier used for removing motors from snow sweepers by the Washington Railway & Electric Company

To remove a motor after it has been loosened from its supports the lower part of the carrier has a chain hoist and the motor is lifted clear with the hoist and the whole carrier is then run out with the motor, which is then lowered to the floor.

This arrangement has proved very satisfactory and not only has saved labor but the ease and expediency of the whole operation have been invaluable in saving time, especially in connection with removal of motors from sweepers, as time is a very great essential when the equipment is needed for service. Such a carrier could also be used to advantage for handling freight in and out of box cars and for loading and unloading material from supply cars.

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*.

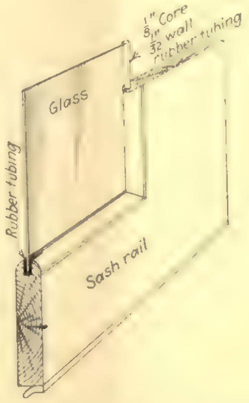
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—CAR BODY—2

Car Glass Set in Rubber Tubing*

By Robert Harris
Master Mechanic New Brunswick Power Company,
St. John, N. B.

MUCH thought is being given to the elimination of noise on electric cars by the New Brunswick Power Company. Vibration and chatter of loose glass have been overcome through the use of rubber-cored tubing. White tubing is used, ½ in. diameter, with 1/32-in. wall. It is applied to the glass by first splitting it with a sharp pointed knife and then slipping the tube over the edge of the glass, starting in the center of any side, and bending the tubing back over the thumb with the index finger to open up the interior. Care is taken not to set the rubber too tightly lest the corners of the glass cut through. With the rubber tubing in place the glass is set in the sash and retained in place by a sash bead.



Application of rubber-cored tubing to car glass

The tubing which is used by the New Brunswick Power Company costs $1.50 per pound and there are 75 lineal feet to the pound. While this cost may appear greater than either putty or felt, the convenience of handling large quantities, the cleanliness and the reduced labor costs that result add to its advantages.

This method of installing glass has been used by our company for two years and the chatter of glass in sash has been eliminated entirely. Glass breakage has been reduced materially and the rigidness of glass has been of particular assistance in keeping out cold. It is now being applied to windows of car doors and transoms and in fact wherever glass is used in cars.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

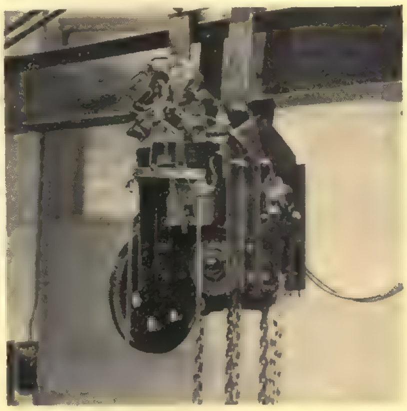
ROLLING STOCK—MISCELLANEOUS—2

Electric Hoist Made from Obsolete Air Compressor*

By Equipment Department
Georgia Power Company

AN OLD obsolete National AA1 air compressor and a chain hoist form the nucleus for an electric hoist which was built recently in the main shops of the Georgia Power Company, Atlanta, Ga. The hand chain wheel of the hoist was removed and an air compressor gear was mounted in its place. The lifting chain wheels were also removed and a piece of ½-in. x 6-in. steel with a 3-in. hole, bored central, was placed over the axle between the body casting and the lifting chain wheels.

The spacing brackets are bolted to these pieces and to four legs, one at each corner, the legs being made of ¼-in. x 2-in. angles. The legs are joined at the top by separators made of ¼-in. plate through which a 1¼-in. bolt passes to fasten the hoist to the carriage which runs on top of an I-beam. The top side of each spacing bracket forms a seat for each corner of the motor portion, which is the electric portion of a National AA1 compressor. The motor portion is bolted to the brackets.



Type of electric hoist constructed in the shops of the Georgia Power Company

The pinion on the armature shaft engages with a second pinion, which in turn engages with the gear attached to the hoist. The second pinion was needed as the gear centers were too far apart. The idler pinion runs on a shaft fastened in the motor frame.

The starting and reversing switch is made of type R governor parts. The contact arm is mounted on a fulcrum pin set in an insulated plate and four contacts are mounted on the arm in pairs. The top contacts are connected to the trolley, the bottom contacts to one side of the fields, and the other side of the fields is connected to ground. Of the four stationary contacts the top two go to each side of the armature and the lower two connect to each side of the armature opposite from the top contacts. This provides for reversal of the armature current.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

5 out of 7

Regularly use "TOOL STEEL" Gears and Pinions

In the Electric Railway Journal, Maintenance Competition, May 21, 1927, seven articles were submitted from men in Philadelphia, Chattanooga, Atlanta, Washington, New Orleans, Birmingham, and Portland, Maine. Presumably these companies are alert in an effort to keep down maintenance costs.

5 out of 7 of these companies regularly use "Tool Steel" gears and pinions,

and

3 of the 7 companies, when buying new equipment, have specified "Tool Steel" gears and pinions on their new motors.

also

In the April contest (April 16th issue of Electric Railway Journal) 5 out of 6 were submitted by "Tool Steel" gear and pinion regular users.

"Tool Steel" gears and pinions reduce maintenance costs; if you take almost any classification of the "Live Wires" in the industry you will find that the great majority keep down their maintenance costs with "Tool Steel" gearing.

The Tool Steel Gear & Pinion Co.
CINCINNATI, OHIO

57% *reduction in car maintenance cost*

ONE of the surest ways to cut excess car maintenance costs is to see that new cars embody HASKELITE and PLYMETL and that old cars are modernized in the same way when repairs are being made. On one road the cost of equipment maintenance on light weight cars is 57% less than it was on the old heavier cars. HASKELITE roofs are helping to make this record possible.

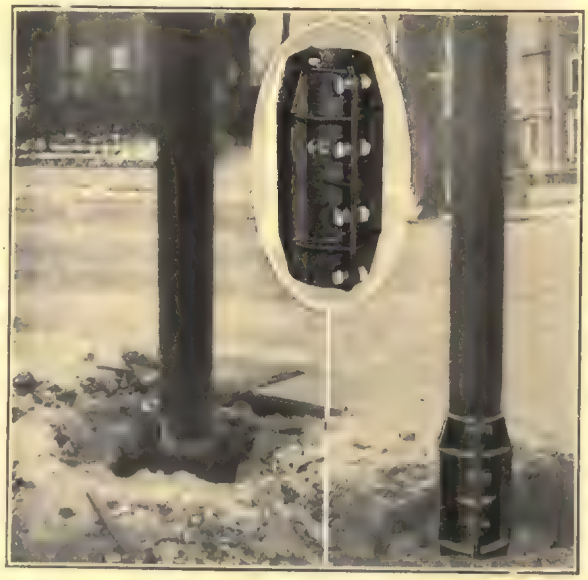
Similar instances are common with cars using HASKELITE roofs, floors and linings, and PLYMETL side panels. In addition to this saving in maintenance cost, such construction cuts operating costs through reduction in weight.

Ask for details.

HASKELITE MANUFACTURING CORPORATION
133 West Washington Street, Chicago

13 electric railways in nine different states have ordered HASKELITE or PLYMETL for repair and rebuilding during the last few months.

PLYWOOD
HASKELITE
PLYMETL



Clark-Williams Tubular Iron Pole Reinforcing and Extension Clamps

Years can be added to the life of any iron pole which has become corroded at the ground level with our REINFORCING CLAMPS, or added height may be obtained by using the EXTENSION CLAMPS.
ALSO MOUNTS FOR WOOD POLES.

Ask for quotations on your requirements.

The Clark-Williams Engr. Co.
886 Main St., Bridgeport, Conn.
Represented in Canada by the Canadian Line Materials, Ltd., Toronto, Ont.

"American"

Light and Heavy SPRINGS

Advantageous location for prompt delivery of raw materials—Ample equipment of modern automatic machinery and appliances — Pyrometer equipped furnaces assuring accurate, uniform heat treatment and over 35 years' spring manufacturing experience constitute a service which means satisfaction.

May we estimate on your needs?

AMERICAN SPIRAL SPRING & MFG. CO.
Established 1887
ARSENAL STATION
PITTSBURGH, PA.,
U. S. A.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—3

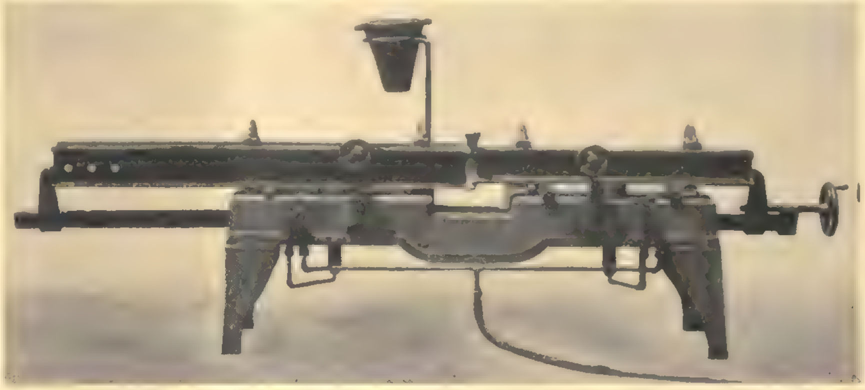
Machine Holds Rails While Welding Compromise Joints*

BY A. TAURMAN
Superintendent of Equipment, Way and Structures, Birmingham Electric Company, Birmingham, Ala.

WHEN the Birmingham Electric Company adopted A.E.R.E.A. 7-in. girder rail for replacing special work as it is renewed we were confronted with the problem of providing a satisfactory and economical compromise joint, to take care of connections of the two different sections of rail. In renewing special work on our lines, most of it has to be done under traffic and therefore it is impossible to weld compromise joints in the track economically.

To reduce the time and cost for setting up and welding the compromise joints a special machine was built for holding and aligning the rails while they were being welded. The machine has a cast-iron frame with four upright arms. These are planed to an accurate surface so as to align the rails. The machine is also provided with a screw clamp for pulling the rail ends together so as to secure a perfect thermit weld.

Prior to the building of this machine it required from one to 1½ hours to line up the rails and clamp them in position for welding, and then we were not always able to secure a straight joint after they were welded. With this machine but five minutes is required to put the rails in place and turn on the air in the cylinders for clamping, and the rails are held in line perfectly.



Rails in position after making a compromise joint

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

Electric Railway Journal Maintenance Data Sheet

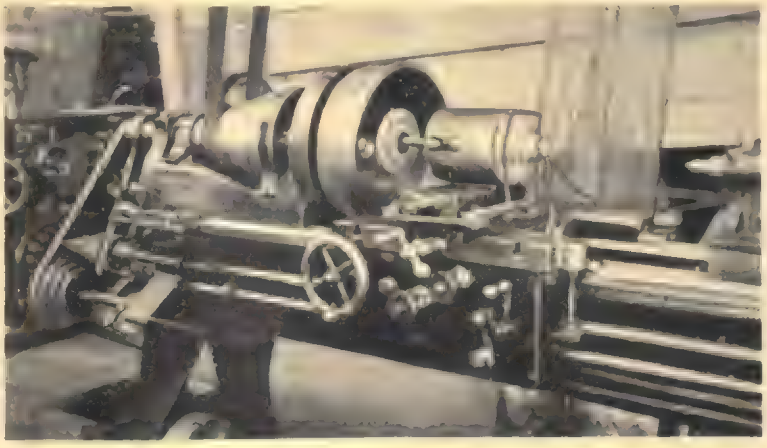
BUSES AND TRUCKS—1

Regrinding Brake Drums for Buses*

BY C. H. COPLEY
Superintendent Springfield Traction Company, Springfield, Mo.

BOTH internal and external brake drums can be reground satisfactorily by a very simple method. This not only keeps the drums from the scrap heap, and so decreases the number of new ones that must be bought, but it also decreases maintenance expense due to the lessened wear on the brake linings which results from the smooth surface.

The method used in our shop is to put the drum in a lathe and true it up with a cutting tool. A small portable track grinder is then attached to the lathe tool rest. This is driven electrically and the drum is revolved slowly in the opposite direction to the grinding wheel. By mounting the grinder on the tool rest the grinding wheel can be moved in or out and back and forth as desired. The grinder which we use runs at a speed of 2,750 r.p.m. and a beautiful finish results.



Brake drum set up in lathe for grinding

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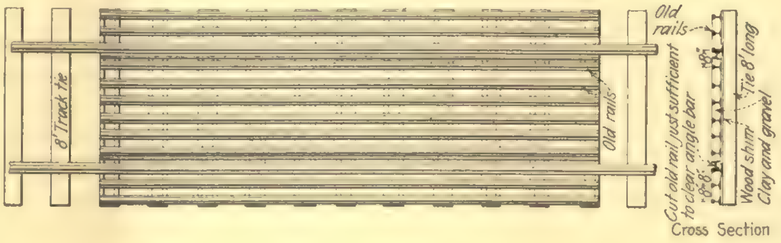
*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—4

Old Rails Used for Railroad Crossings*

By F. H. Midgley
Engineer Grand River Railway and Lake Erie & Northern Railway, Galt, Ontario



Method of making crossing by use of old rails

TO EFFECT economy in the cost of renewing planking of highway crossings, our systems have adopted a crossing made up of scrap rails as shown in the accompanying illustration. Plank crossings last but eight months, while the crossings made by using scrap rail are good practically for all time with an occasional disturbance to renew the crossties.

Our running rail is 85 lb. and we use 56-lb. scrap rails laid parallel to the tracks for the full width of the ties, spiking them to the ties at about 8 in. centers. To provide flangeways the rails adjacent to the running rails are laid on edge. The space between rails is filled in with gravel and clay and sprinkled with crude oil about twice a year. We have put in many crossings of this type on paved streets, and municipal and other officials have expressed themselves as being perfectly satisfied.

The cost of a 20-ft. crossing laid with rail is $20 for twelve 56-lb. scrap rails 20 ft. long, approximate weight 2 tons, and $18 for the labor of installation, making a total of $38. The same length of crosing laid with 4-in. planks would cost $40.50, made up of $19.20 for six pieces of planking 4 in. x 12 in. x 20 ft. long, two pieces of 56-lb. scrap rail $3.30 and the labor of applying $18. The initial cost of the rail crossing is less.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

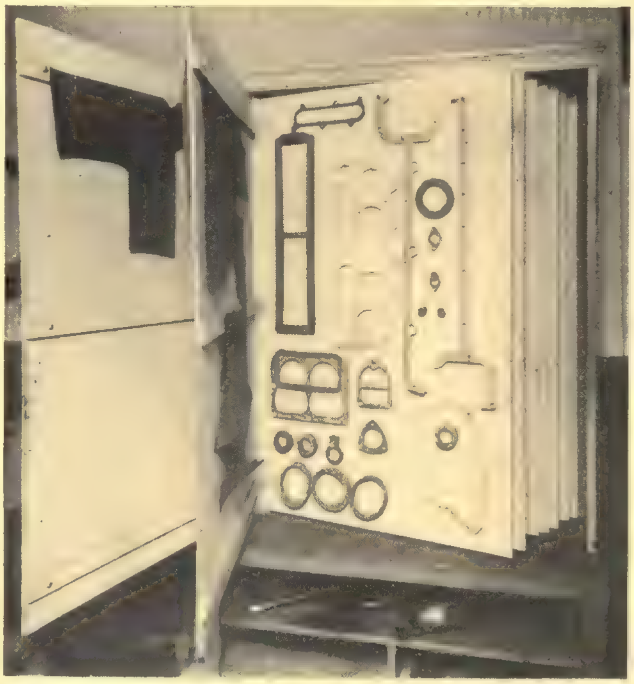
Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—2

Hinged Gasket Boards Conserve Space*

By Robert M. O'Brien
Superintendent of Rolling Stock and Shops New Orleans Public Service, Inc., New Orleans, La.

THE accompanying illustration shows a type of gasket board that is proving of particular benefit at our bus garage. It consists of nine hinged boards or leaves which fold up like a book. The capacity of such a board for a given amount of space is obviously very large. In addition to this the advantage of having gaskets hung neatly so that they cannot be bent or broken is proving of particular advantage. Certain leaves are used for different types of buses, so that the location of any particular gasket becomes but a moment's job. Depletion of the stock is very noticeable with this type of board.



Gasket boards are hinged so as to fold into a small space

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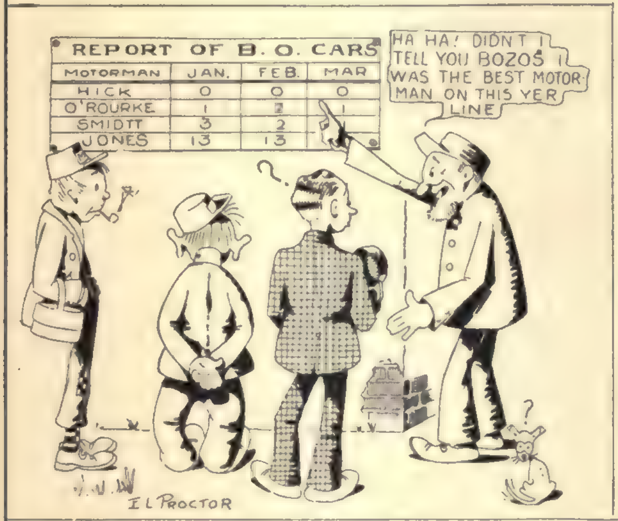
*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Adventures of

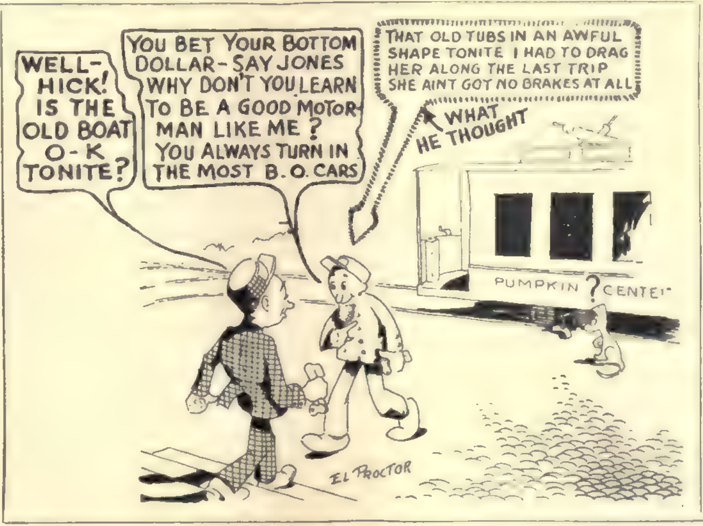
Old Man Trouble

on the

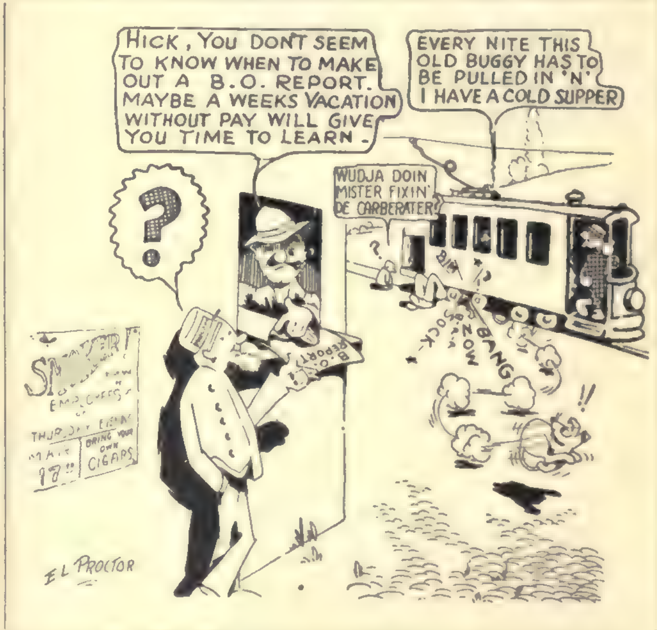
Hicksville Railway


REPORT OF B. O. CARS
MOTORMAN | JAN. | FEB. | MAR
HICK | 0 | 0 | 0
O'ROURKE | 1 | 2 | 1
SMIDTT | 3 | 2
JONES | 13 | 13
HA HA! DIDN'T I TELL YOU BOZOS I WAS THE BEST MOTOR-MAN ON THIS YER LINE
?
?
E L PROCTOR

A GOOD motorman is not determined by the fewest number of bad-order cars which he reports. The repair of cars is the particular job of the mechancal department, and by reporting bad-order cars promptly motormen are co-operating to reduce detentions in service and decrease annoyance to passengers.


WELL-HICK! IS THE OLD BOAT O-K TONITE?
YOU BET YOUR BOTTOM DOLLAR-SAY JONES WHY DON'T YOU LEARN TO BE A GOOD MOTOR-MAN LIKE ME? YOU ALWAYS TURN IN THE MOST B. O. CARS
THAT OLD TUBS IN AN AWFUL SHAPE TONITE I HAD TO DRAG HER ALONG THE LAST TRIP SHE AINT GOT NO BRAKES AT ALL
WHAT HE THOUGHT
PUMPKIN CENTER
E L PROCTOR

Your physical energy and the railway's financial energy are drained by worrying along with a car unfit for service.


HICK, YOU DON'T SEEM TO KNOW WHEN TO MAKE OUT A B.O. REPORT. MAYBE A WEEKS VACATION WITHOUT PAY WILL GIVE YOU TIME TO LEARN -
EVERY NITE THIS OLD BUGGY HAS TO BE PULLED IN 'N' I HAVE A COLD SUPPER
?
WUDJA DOIN MISTER FIXIN' DE CARBERATER?
B.O. REPORT
BANG
POW
SOCK
BRING YOUR OWN CIGARS
E L PROCTOR

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & M'g. Co

Improved Equipment

Additional Tools for Electric Railway Maintenance

MANY letters of commendation have been received from our readers regarding the value of short descriptions of improved equipment for railway maintenance. We started the publication of such items in the March 19, 1927, issue, in which sixteen pages were included. Additional items were published in the April 16 and May 21 issues and now we are adding the fourth installment. Such descriptions of the latest tools which can be adapted to electric railway maintenance work enable those responsible for maintenance practices to visualize the shortcomings of their particular equipment and provide for changes which will put their maintenance work on a higher plane. Modern tools speed up repairs and assist in making a railway prosperous.

◆

Low Resistance Test Set

EVERSHED & VIGNOLES, LTD.,
Chiswick, London, England

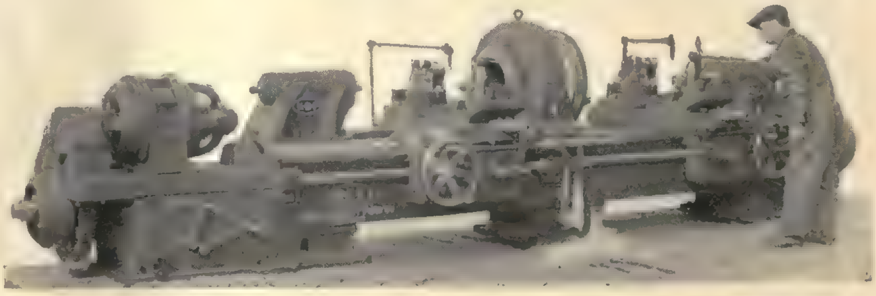
FOR testing railway armatures, locating bad rail joints or other low resistance measurements a direct reading low resistance ohmmeter known as the "Ducter" is available. This set gives direct readings of resistances from 5 ohms down to 5 microhms and as no adjustments are required observations can be taken very quickly. The method employed for testing armatures is shown in the accompanying illustration, which was taken in the Durnsford Road repair shop of the Southern Railway, London, England.

The "Ducter" test set consists of two coils mounted on a common axis and swinging in the field of a permanent magnet. The coils are fixed at a definite angle on their mounting and carry a pointer moving over a scale marked in microhms. Current is supplied by a battery and the current or control coil is tapped across a shunt in one of the battery leads and, therefore, carries a current proportional to the total current flowing in the main circuit. The potential coil is tapped off the resistance under test and carries a current proportional to the potential drop across the resistance. As the movement is not controlled by any other forces, its final position is dependent only on the ratio of the total current to the potential drop through the resistance. Fluctuations in battery current have no effect on the accuracy of the readings within ordinary working limits.

Axle Lathe

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

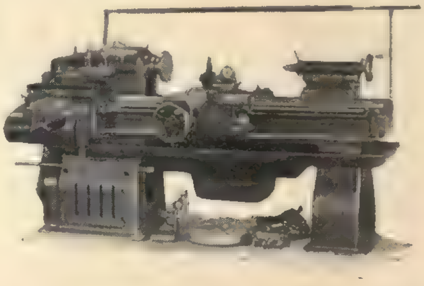
DESIGNED for production work on axles, the bed of this lathe is rigid and is reinforced by cross-girts of box section 8 in. wide. The carriage bearings consist of a flat way at the back of the bed and a way of compensating V shape at the front, with angles of 15 deg. and 70 deg. The center driving head completely incloses the main driving gear, forming an oil reservoir for it. It is adjustable longitudinally along the bed. The main drive is by a large steel herringbone type gear and pinion carried between bearings in the head. The two carriages have power longitudinal feeds, by a right and left-hand screw positively driven by gearing. A complete lubricating system for the tools consists of pump, jet pipes, reservoir and collecting channels. The tool slides have a trough connected with channels in the carriage bridge for carrying off the lubricant. The aprons are double-walled and all of the mechanism, except the operating levers, is completely inclosed, as are the feed gears, at the right-hand end of the bed. The carriages have hand traverse on the bed and the tool slides have hand cross feed. The axle is carried on dead centers mounted in two heavy tailstocks, which are adjustable longitudinally along the bed and can be clamped in position by four anchor bolts. To prevent slipping, a pawl engages a rack cast in the bed. A handwheel adjusts the spindle of the right-hand tailstock. These machines can be driven by a single or cone pulley or by a constant or adjustable speed motor.



16-in. Lathe

PRATT & WHITNEY COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

LATHES of this type can be furnished either with a geared head for independent motor drive, with a single pulley or with a cone pulley head for belt drive. The back gears of the headstock are mounted below the spindle. The headstock is centered over the bed and the operator is given greater freedom of movement and uninterrupted light on the work. The sliding speed change gears are made of hardened chrome-vanadium steel. They are fully inclosed and splash oiled and are shifted by two levers on the front of the head. The cone head has a solid housing and the same back gears as the gear head.

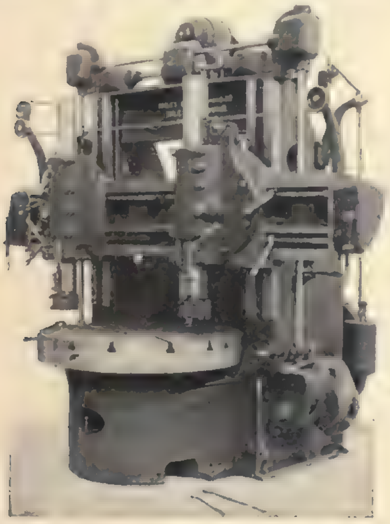


The positions of the ratio lever and rocker arm for any desired feed or thread are located by a large direct reading index plate mounted on the quick-change gear box. The compound rest handwheel is set at an angle of 20 deg. above its screw. This allows headroom and provides space for a large legible dial graduated in half-thousandths to conform to micrometer readings. The lever operating the combined stop and reverse rod is located at the right end of the apron. For fine threading the handwheel may be disengaged from the rack pinion through the knob to the right of the large handwheel. The apron is also equipped with the usual knob for power cross feed and lever for engaging the screw. A taper of 45 deg. may be cut by the simultaneous use of both cross and longitudinal power feeds. The tailstock has a long solid barrel and a large graduated spindle. It is clamped to the end by an eccentric shaft parallel to the spindle, and the same handle provides a means of moving it along the bed.

Boring and Turning Mill

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

BOX-GIRDER, double-webbed housings without an opening in the front are used in this boring and turning mill, the cross rail elevating screws being located between them. They are bolted securely to the bed and are tied together firmly by a heavy top brace. The table, supported by an annular bearing, running in a bath of oil, is driven by a bevel gear. For clamping purposes the table is regularly provided with four pairs of parallel T-slots and eight radial T-slots. The spindle is long, of large diameter, and has upper and lower bearings. The box-girder cross rail is of the three-track type, having a narrow guide at the bottom with a saddle traversing screw located between the guiding surfaces. The saddles have accurately scraped bearings on the cross rail. The boring bars are steel forgings of octagon section. The tool holders are steel forgings with provision for clamping tools for boring, turning and facing. They have straight shanks and may be easily removed for the insertion of special boring bars or cutters. The feeds are positive, continuous and independent for each head, both in amount and direction.

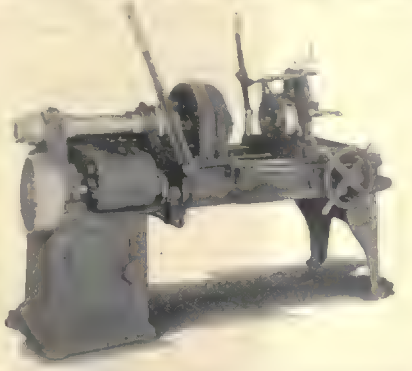


Eight different feeds for cross, vertical and angular feeding can be obtained by levers on the two feed boxes. Rapid power traverse for the saddles and boring bars is controlled by a lever located above the feed box and near the work. This lever has four positions, two of which engage rapid power traverse in either direction and the other two engage power feed, fine and coarse. The machine can be driven by a belt or by means of a constant or adjustable speed motor.

No. 2 and No. 3 P.D.Q.C. Improved Pipe Machine

BIGNALL & KEELER MACHINE WORKS
OF THE N. O. NELSON MANUFACTURING COMPANY,
Edwardsville, Ill.

MACHINES of this line take their name from the use of the Peerless die and quick chuck. They are said to have proved popular for threading small sizes of pipe. The cut-off tool is made of beveled high speed steel, and the reamer and thread-length gage aid in producing good work. Designed for single pulley operation, a constant speed electric motor can be used if desired. Shifting the gears in the gear box permits of obtaining six spindle speeds. The Peerless die head is provided with five dies per set. The die has a full bearing against the cam ring. Turning the adjusting screw expands or contracts the dies for threads of different gages. The quick acting chuck is made with tempered tool steel grippers with M form teeth which can be sharpened. A Landis die head can be furnished.



The No. 2 machine is capable of handling ¼-in. to 2-in. pipe and the No. 3 ¼-in. to 3-in. pipe. The No. 2 machine occupies a floor space of 28 in. x 77 in., whereas the No. 3 occupies a space of 30 in. x 90 in.

Combination Journal Turning and Axle Lathe

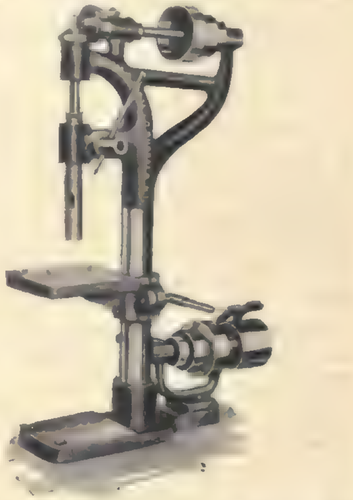
NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hamilton, Ohio

EITHER outside or inside journals can be turned simultaneously with this machine on axles having wheels up to 42 in. diameter on the tread, with wheels in place. When being used as an ordinary axle lathe, the outside carriages are arranged for turning collars, outside journals, sand guards and wheel seats, when the wheels are not in place. The inside carriages are used only for inside journals. The lathe is of the center drive type, the top portion of each end of the bed being arranged to slide and thereby forming gaps to allow mounted wheels to clear. The center driving gear has a projecting sleeve or bearing on each side and the gear is in halves, the drive being by a pinion carried in the bed. The center head has a hinged cap which completely covers the center gear and forms a continuous bearing for it. The four carriages are fitted with longitudinal feeds by screw and bronze nuts of the open and closed type. The tool slides on the outer carriages have hand cross feed and those on the inner carriages have hand and power cross feeds. Burnishing attachments are furnished on the two outside carriages only. Two tailstocks carried on the upper bed members have spindles which are adjusted by means of hand wheels.

Power Bench Drill

BUFFALO FORGE COMPANY,
Buffalo, N. Y.

CORRECT alignment of gears and shafts in the Buffalo 10-in. power bench drill shown is insured by its substantial one-piece frame. The upper cone pulley is supported between the bearings instead of being overhung. This reduces unnecessary strain on the shaft. The countershaft has tight and loose pulleys and a belt shifter. Feed lever and spindle are held by means of a friction spring, assuring the spindle remaining where placed. The work table is adjustable up and down or can be pushed to one side. The bench can also be used as a table, since it is planed carefully and accurately and has countersunk bolt holes. It will drill holes up to 5/16 in. with great speed.



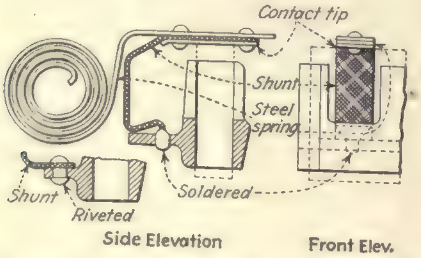
Combination Riveting and Brake Relining Machine

RELINING of bus brakes and for countersinking and riveting is the function of a new type of equipment put out by the Manley Manufacturing Company, York, Pa. The machine consists of a drilling and countersinking mechanism, together with a heavy-duty riveting machine mounted on a support that serves as a bench. This has heavy iron legs with a natural wood top. A clamp is provided for holding the brake lining while cutting. A rod for holding the rolls of brake lining is also provided.

The drilling and countersinking machine operates on a different principle from that usually employed. The hole in the brake lining is drilled independently, using the holes in the brake band as a templet. The countersinking is done from underneath by reverse action.

Twin-Washer Brush-Holder Mechanism

TO MEET the demands of a large number of railway operators for a brush-holder pressure finger with few wearing parts and one which can be applied generally to a large number of old and new types of railway motor brush-holders, the Westinghouse Electric & Manufacturing Company has developed the twin-washer type brush-holder mechanism. The entire movement over the brush range is obtained by the opening and closing of the spring itself, there being no movement between the barrel and the shaft. Adjustment of pressure is made only in the shops.



Method of attaching shunt to new type brush-holder mechanism

The finger is designed to use a twin-washer and a barrel adjustment on a 3/8-in. diameter spindle instead of the harness with ratchet and pawl. The twin-washer limits side play of the spiral spring and the barrel gives a satisfactory adjustment. The end of the spiral spring extends out over the carbon box and has a flat contact tip and a braided shunt riveted to it. This provides a contact tip that is easily renewed. The end of the shunt is twisted and soldered into a 7/32-in. diameter hole in the bottom of the casting.

The new pressure finger is interchangeable with all of the harness type fingers using a ratchet and pawl with a few minor changes. To mount the new fingers in old brush-holders, the 5/16-in. hole for the spindle should be reamed to take the new 3/8-in. spindle. A 7/32-in. diameter hole should be drilled in front of the two holes that were used for the spring clips and the shunt soldered into the casting. After assembly a hole should be drilled through the casting and spindle for a 1/8-in. cotter to anchor the spindle to the casting.

Dick Prescott Shows His Spirit

And Wins the Men

WHEN Dick Prescott, assistant superintendent in the Consolidated Railway & Light Company's shop, started for the truck shop with Bill Johnson, the foreman, the young executive did some very fast thinking. Consequently as he approached the group of workmen idling at one corner of the shop, after having refused to go to work, he had determined his course of action.

Dick knew that he had little chance of successfully handling the situation if he permitted himself to be drawn into a purposeless argument with the entire disgruntled group. On the other hand, he had come to the shop himself to face them instead of sending Bill Johnson back with a message.

As he entered the shop the men saw him coming, and there was an ominous silence.

Dick stopped and surveyed the group for a moment before speaking.

"What's the trouble with you men?" he asked. "Why aren't you all on the job?"

"Aw, dis is a helluva shop t'work in," spoke up "Shorty" Green, pal of Pete Welcher and one of the instigators of the present trouble, who was standing far enough back in the crowd to think he was out of Dick's sight.

"I wish the man who made that remark would step out here where I can see him," quickly snapped Dick. Nobody moved. After waiting for a moment the young executive, though realizing that this was a critical moment, spoke deliberately.

"I don't know what you men have on your minds," he said. "If any of you have received unfair treatment, either at my hands or by one of the foremen, I want to know it.

"This is a good shop to work in. No man who is doing an honest and capable day's work needs to worry about his job. But this sort of thing won't go. My door is always open to any of you who has a fair grievance. I want you to get on your jobs immediately. If there is something you want to bring to my attention, select three of your number and send them to my office during the lunch hour today. I shall be glad to talk with them then."

Dick turned on his heel and walked away from the group, which remained silent for a moment after he had gone.

"I think dat's a damn sensible suggestion," remarked big Pete Thompson, glancing after the disappearing form of Dick Prescott. "Why should we all act like a lot of nuts just because a few guys get what they think is a grievance. I think it's a grouch, not a grievance. If some of you guys would do more working and less talking you wouldn't have so many troubles. I notice Shorty back there did a helluva lot more talkin' before the boss got down here than he did when he had a chance to tell his troubles to somebody who could do somethin' about it."

"Why didn't you say something?" queried Shorty.

"I ain't the guy dat started dis," snapped back Pete. "Dis is a good job and I don't want'a lose it, either. I'm goin' back to work."

Pete was soon followed by some of the others, and after a few moments even the ringleaders of the movement reluctantly gathered up their tools and resumed work.

Association News & Discussions

Don't Be Too Easily Satisfied, Urges President Sawyer

President Sawyer, Managing Director Storrs, Charles Gordon and J. W. Colton Give National Perspective of Industry to Midwest Electric Railway Men During Annual Meeting

"WE ALL need a mental inventory," declared W. H. Sawyer, president of the American Electric Railway Association, in addressing the annual meeting of the Mid-West Electric Railway Association, held in St. Louis, Mo., on June 9-11, 1927.

"As I have traveled to various cities and talked with railway men who are doing things," said the national president, "I have become convinced that most of us who have been inclined to feel that we are doing a fairly good job are barely scratching the surface of the possibilities for progress in many directions. I believe that we need a mental inventory. We have been too easily satisfied. There are many opportunities for improvements in practices on our properties and in our method of conducting operations that will improve the showing on our balance sheets. On every hand there are examples of properties that are doing an improved job. If we will combine on our own properties each advance step taken by those who have been going ahead in certain directions, the opportunities for improving the condition of our properties are manifold. If we will open our eyes and our minds to what others have already done we can find many things in successful practice which we have dismissed as impossible. Likewise, there are many suggestions for new ways of improving performance and net revenue."

Speeding up of service was one of the things that Mr. Sawyer mentioned specifically as offering ample room for improvement on most properties, once there is the determination to go ahead despite obstacles and objections.

Increase of courtesy on the part of employees was cited as another example of a wide field for improvement despite the progress which has been made in this direction. The management's own performance in transmitting inspiration to its employees was still another phase of the present-day problem which the speaker felt could profitably be subjected to critical and intensive analysis on most properties. Likewise, the practices and methods in the shop, and maintenance performance in general were held to be subject to substantial improvement. In acquiring a knowledge of merchandising and advertising methods and their application to the transportation business, the industry has barely started, according to Mr. Sawyer. In working out the proper methods and angles of approach for the improvement of community relations, there is much more to be learned than is now known. Only a start has been made in the improvement of cars and the character of the ride sold by most railway properties.

"Public transportation is a necessity to community existence and progress," continued Mr. Sawyer. "It must be furnished by some agency. If the men now at the helms of these many properties don't find a way to provide better transportation, somebody else will. Improvements will be made, either by us or by some one else. This convention will have been most successful if we each leave here convinced that we have not been doing all that it is possible to do; if we leave with the determination to go back to our properties questioning every method and every precedent that we have been inclined to consider good enough, or the best that could be expected in the circumstances."

COMING MEETINGS

OF

Electric Railway and Allied Associations

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24—**American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 26-27—**Public Utilities Advertising Association, Hotel Albany, Denver, Col.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Sept. 13-15—**International City Managers Association, Dubuque, Ia.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

Mr. Sawyer pointed out some of the signs of progress which he had observed in visits to various properties. He said that the transportation systems in most of the larger cities of the country have definitely turned the corner and are going forward. He mentioned Chicago as a city in which the railway, though a part of the lines are technically in receivership, is making improvements rapidly and is actually on a profitable operating basis.

Milwaukee was cited as another example of real progress. New track is being built, cars are being improved, new lines on private right-of-way are being put in to speed up suburban and interurban service. "In Milwaukee they are spending large sums of money for the betterment of service," he said. "They believe in the electric railway business, and they are backing their opinion with good money. They are looking not to tomorrow, but into the future—five years, even ten years in some cases. They are making plans there that promise to give Milwaukee one of the finest transportation systems in the country. They are trying to not only meet the needs of the city but to anticipate them. They have met opposition at each step, but they are determined to progress, and the results they are accomplishing more than justify their spirit and confidence.

"I had the pleasure of talking to 700 graduates of educational classes in the employees' mutual benefit association in Milwaukee. There were 700 employees who are trying to better themselves. It was an inspiration to me. On that property they have succeeded in arousing an incentive and a spirit that has few parallels in our industry. The management there is getting co-operation from its employees because it is giving co-operation."

Referring to the work of the American Electric Railway Association, President Sawyer explained the reasons for the proposed revision of dues that will be submitted to the coming convention in Cleveland. He called attention to the low rate which has existed in the railway association in comparison with the other utility asso-

Delegates to the annual meeting of the Mid-West

ciations. He pointed out that the revised constitution is to be submitted only after a very careful study has been made of all the association's activities, with a view of ascertaining that the industry is getting full value for its money.

He also outlined the changes which are to be made in the association's magazine, *Aera*, including elimination of advertising and reduction in the number of pages of general articles suitable for publication in the technical press. Through reduction in bulk it is hoped not only to save money but to make the information published more readily available. At the same time an effort is to be made to direct *Aera* more definitely to the purpose of promoting the association and the industry through fuller interpretation of the work of the association and its committees and through publication of material that will be inspirational to individual member employees. Fuller co-ordination between the association and the industrial press was given as another reason for the change.

After having visited the National Electric Light Association convention at Atlantic City, President Sawyer said that he was more convinced than ever of the wisdom back of the decision to take the railway convention to Cleveland a second year. He said that a recent visit to Cleveland impressed him with the fact that the convention committee there is on its toes and that satisfactory arrangements are being made rapidly. More than 80,000 sq.ft. of exhibit space had already been sold in comparison with 60,000 sq.ft. at the same time last year. One of the most promising features of present developments is the assurance of a car exhibit that will probably exceed that of last year in point of size and interest.

Although neither Lucius S. Storrs, managing director of the association, nor J. W. Colton, editor of *Aera*, was able to be present personally, papers which they prepared were read by Labert St. Clair of the association staff. Mr. Colton discussed the subject of municipal ownership of railways in the United States, outlined the history of the municipally owned properties in the country and cited their records of experience to refute the contention by municipal ownership advocates that public ownership and operation, with its attendant political meddling, has any advantages for the riding public.

Mr. Storrs again called attention to the need for co-operation between management, public and employees. He outlined the fundamentals to successful local transit as laid down by the advisory Council, emphasizing the obligations of each of the three groups that have an interest in transportation. He considered it significant that transportation progress has occurred rapidly wherever the three groups have abided in the main by the principles necessary for fair dealing.

Mr. Storrs declared that the industry is making definite progress in many more cities than is generally recognized. The fare issue, which was once the chief cause of controversy in almost every city, no longer is the dominating one in most communities.

"I have seen many complicated transit situations," concluded Mr. Storrs. "Some of them seemed too tangled ever to be straightened out. But I have found that when citizens of constructive minds, business men and other leaders who had the welfare of their communities at heart, began to take an interest, the negotiations got some place."

Another national view of the railway situation was given in an address entitled "You Can't Sell Cotton Goods in a Silk Age," by Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, which is printed elsewhere in this issue.

WELCOMED BY MAYOR

Victor J. Miller, Mayor of St. Louis, welcomed the Mid-West Association to the city. In responding, A. T. Perkins, manager for the receiver of the United Railways of St. Louis, said that the backing of responsible business people is essential in establishing improved public relations. In winning this backing, he said, there are two ideas which have not been sufficiently developed, namely, that the electric railway is a large buyer in the local market and railway employees constitute a large body of retail customers whose jobs depend upon the continued existence of the transportation company.

As an example of the importance of a railway in the local market, Mr. Perkins said that his property purchases 18,000 different items of material and supplies from 900 factories in the St. Louis district and at an annual cost of $3,000,000. From the standpoint of employee purchasing power the speaker estimated that the 6,000 employees of the United Railways, a large part of whom are buying homes, constitute with their wives and children some 20,000 retail customers.

Dr. Robert Hyland, chief surgeon United Railways of St. Louis, talked on the work of a medical department in a railway organization and its importance in keeping employees contented and efficient through care of their health.

A question regarding the proper basis for setting up pension reserves so as adequately to meet the need of increasing age among employees was raised by F. G. Buffe, vice-president and operating manager Kansas City Public Service Company. Adequate reserves are necessary, in the opinion of Mr. Buffe, to take care of the reduced turnover with advancing age which results from a pension system.

"The Human Element in Industry" was the subject of an address by E. S. McClelland, director of personnel Westinghouse Electric & Manufacturing Company. He defined the personnel department of an organization as the agency responsible for breathing into it and maintaining the spirit of its founder. Maintenance of a proper morale among employees, he explained, involves dealing with the elusive and delicate reactions of human nature. Credit and adequate recognition of the worker's part in any business organization was held to be essential to effective teamwork.

J. B. Sheridan, secretary Missouri Committee on Public Utility Information, talked on the value which utility service confers upon communities. He said that undeveloped land has little value for residential or business purposes until transportation and other utilities come in. The average real estate dealer does not sell only land. The value of utility service is a large part of the selling price, and the land speculator pockets the profit while the utilities continue to bear the burden of

Electric Railway Association held at St. Louis June 9-11

rendering service in sparsely settled territory. It is this interest of the land speculator, not the public itself, which produces the continuous pressure for railway extensions into new territory.

Speakers at the banquet on Thursday evening, held on the roof of the Chase Hotel, included the Rev. R. J. Wilbur, J. H. Brod, director of safety City of St. Louis; Senator Gardiner and J. C. Hall, counsel Missouri Association of Public Utilities.

H. B. Cobban, general manager Northeast Oklahoma Railroad, was elected president for the ensuing year. F. G. Buffe was elected first vice-president, R. J. Lockwood second vice-president and J. A. Weimer was re-elected secretary-treasurer. The following executive committee was also selected: A. E. Reynolds, R. A. Leussler, H. W. Patten, B. Hilburn, B. W. Frauenthal, D. L. Fennell, J. L. Adams, R. B. Campbell.

President Reynolds reported the receipt of an invitation to hold the next meeting of the association in Hot Springs, Ark. Mr. Buffe also extended an invitation on the part of Kansas City to hold the next meeting there. The time and place were left in the hands of the executive committee.

Preservative Treatment of Pine Poles*

By E. E. Boehne
International Creosoting & Construction Company

Use of creosoted pine poles, according to government statistics, increased 500 per cent between 1920 and 1925. Five hundred thousand were installed in 1923. That number increased to 1,000,000 in 1924. This is particularly significant because it was the only species of pole the use of which materially increased during that period. Obviously a definite swing of the industry is represented here.

A pole's worth is measured by the length of time it gives satisfactory life in the line. What shortens that life in the great majority of cases is decay. Decay, then, and its prevention are prime points for consideration.

Decay in wood is caused by low forms of plants called fungi, and by bacteria. Through the secretion of little understood chemicals, they dissolve the wood fiber, and its substance serves as food for the fungus. The science of timber preservation consists in poisoning that food, the wood. Creosote is the poison. The operation of injecting it deeply into the wood by pressure is the work of the modern wood preserving plant. There are other wood preservatives, but creosote is the best known.

The first step in the creosoting of pine poles, or, rather, a step preliminary to their treatment, is to season them; that is, to remove a sufficient amount of the moisture which all freshly cut wood contains to permit the entrance of the creosote. This is accomplished either by allowing the wood to dry on a seasoning yard or by steaming it in the treating cylinders.

Two processes have recognized standing and are in general use for pole treatment. They are the Bethel process, using 12 lb. of creosote per cubic foot of wood and leaving the wood cells full of creosote after treatment, and the Rueping process, retaining 8 lb. of creosote per cubic foot and leaving the wood cells partially empty after treatment.

In the Bethel process, after the material is placed in the cylinder, a vacuum of about 24 in. is maintained until the wood is as dry and free from air as practicable and then, without first breaking the vacuum, the cylinder is completely filled with the creosote oil. After the retort is filled, additional creosote is forced into the cylinder by means of pressure pumps, the pressure being gradually raised to and maintained at not less than 125 lb. per square inch at a temperature of 180 to 200 deg. F., until the required amount of the preservative has been forced into the wood. The pressure is then released, the oil drained from the cylinder and another vacuum drawn. The object of this final vacuum is to remove the surplus creosote from the surface of the timber, thus making the wood drier on the surface and cleaner to handle.

In the Rueping process, as the first step, air is pumped into the cylinder and thus into the wood under high pressure; then while this air pressure

Correct method of stacking poles in seasoning yard. Uniform spacing, wide alleyways between stacks and creosoted separating strips between each layer of poles provide thorough, even air seasoning

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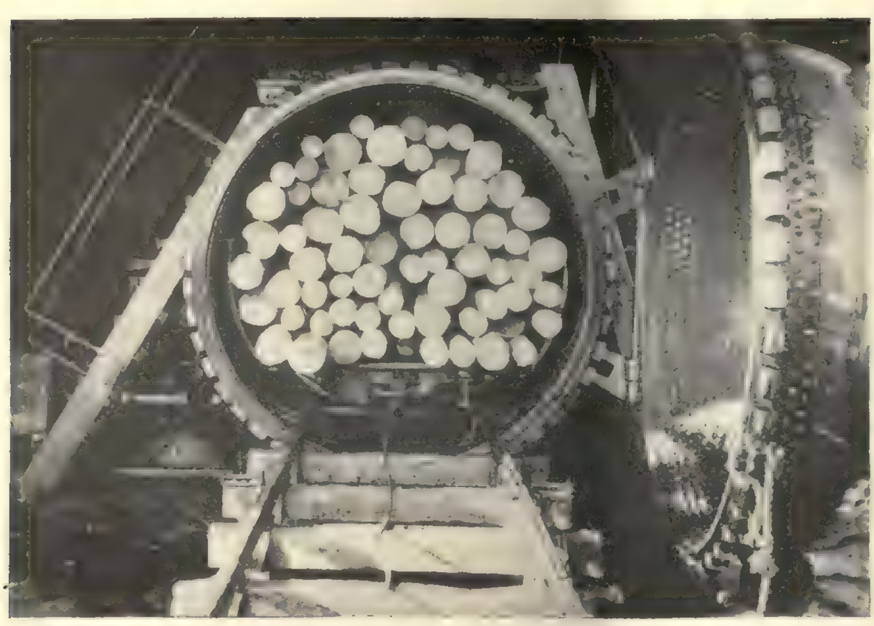
*Abstract of a paper presented before the Missouri Association of Public Utilities, Cape Girardeau, Mo., May 6, 1927.



Ready to seal the cylinder door and begin treatment. This cylinder is 165 ft. long and 9½ ft. in diameter. It has standard-gage track

is maintained the cylinder is filled with creosote. As the oil enters, the air is gradually released, but without allowing the pressure to drop. In this way the cylinder is filled with oil and a considerable quantity of air is entrapped in the wood at the same time. More oil is then pumped in and the pressure is increased. After the maximum quantity of creosote has been injected the pressure is released, the oil drained from the cylinder and a final vacuum applied. This reduction in pressure allows the air entrapped in the wood to expand and force out much of the oil originally injected, leaving partially empty wood cells. The initial injection on 8 lb. Rueping treatment averages 16 to 20 lb. of creosote per cubic foot of wood.

Pine, of all the commercial species, is the most susceptible to preservative treatment. In a given cylinder charge creosote applied as just described penetrates many poles throughout. Deep penetration is an all important factor, for it is practically a direct measure of the value of treatment; this because any kind of wood will check, and once the checks extend in beyond the creosoted layer untreated wood is exposed to decay and insect attack. Deep creosote penetration, therefore, is a first essential to good pole treatment.

The strength of pine is the highest, the most permanent and the most uniform of any of the pole woods. Exhaustive government tests show its modulus of rupture to be over 30 per cent greater than the nearest other pole species. What is almost as important is that fifteen or twenty years after installation that strength is no less than when the poles first went into the line. The Bureau of Standards, after studying the plotted results of the load-in-pounds at which hundreds of test poles broke, pointed out that the strength of individual poles in the Southern yellow pine group departed less from the average than any of the other species.

The life of creosoted pine poles is not known, because the oldest installations are still in use; their present condition is good and there is nothing to indicate how much longer they will last. Several lines for which records are available show less than 10 per cent renewals in 25 to 30 years. In many lines ten to twenty years old it has not been necessary to replace a pole. The remarkable thing is that these very old poles are still in apparently splendid condition. An increment boring taken at the ground line on a 25-year-old pole is of such appearance that if placed in a group of borings from creosoted poles just from the treating cylinder it could not be distinguished.

A few lines that have given long service are: Oklahoma Railway, 200 poles installed 1908. No replacements to date. Southwestern Bell Telephone Company, Dallas to Sherman, Tex., installed 1909, 50 miles in length. No replacements to date. American Telephone & Telegraph Company, Washington, D. C., to Norfolk, Va., installed 1897, 90 per cent of poles unaffected by decay, according to the most recent A. T. & T. inspection report. Lake Charles Railway, Light & Water Works, Lake Charles, La. Poles for city service installed 1899, 1 per cent replacements to date. Beaumont-Port Arthur, Tex., interurban line. Six hundred and ninety-two poles. Line installed 1912. To date three poles replaced (mechanical causes; not decay).

TERMITES OR WHITE ANTS

The attack of white ants on poles is becoming an increasingly vexing problem. Once they gain entrance to a pole nothing can stop them. The status of creosoted pine poles, with regard to white ant attack, is covered by a statement in government bulletin No. 1231: "The most effective preservative in protecting timber to be set in the ground from attacks by termites is coal-tar creosote. . . . Impregnation by the full cell process with coal-tar creosote renders wood resistant for at least 25 years."

Mileage the Logical Basis for Bus Depreciation*

BY D. E. BLAIR
General Superintendent Montreal Tramways

DISCUSSION of this subject should be prefaced by a clear definition of the meaning of the word. One authority states very concisely that: "Depreciation is the financial effect of deterioration, wear and tear, obsolescence and inadequacy."

Impaired value of physical assets is the rock upon which many industrial organizations come to grief. Many fail to realize that the building up of a depreciation reserve account is a very real and tangible operating charge that must be met by deductions from income in the same way as we meet the daily expenses for gasoline or for chauffeurs' wages.

Any machine that consists of an assembly of working units is subject to wear and tear and loss of efficiency, reliability and general appearance. The main units of a single machine will not all be worn out and ready for the scrap heap at the same time and some of the minor units will be worn out and renewed several times before the major elements of the machine show any important deterioration. Furthermore, all the units of a fleet of buses will not be replaced at the same time.

As time and usage continue, the number of integral parts that require repair and replacement increases; the cost of maintenance per mile increases in proportion and a point is reached, sooner or later, when it is no longer economical to preserve the value of the original investment because of the high rate and cost of repairs.

It is impossible, when setting up a rate and a basis upon which depreciation charges are to be applied, to predicate with any degree of accuracy the proportion of weight that each one of the factors in our definition of depreciation will bear when the vehicle under consideration is replaced.

We can base our estimates upon our own past experience and upon that of others, keeping in mind the fact that as an art develops, engineering practices improve and fashions become more stable.

Under equal conditions of operation, we can properly assume that the best vehicle of today will have a longer useful life than the best vehicle of yesterday. Furthermore, the probability of having to discard a vehicle because of obsolescence or inadequacy while it is still economically serviceable is not so great as in the past.

The rate of deterioration of value is

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*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

	New York			Youngstown			Montreal		
	1924	1925	1926	1924	1926	1926	1924	1925	1926
Depreciation per cent of capital account.	13	21	13	25	25	25	....	20	20
Depreciation, cents per mile............	2.18	3.91	2.93	4.22	3.93	2.83	....	4.94	5.09
Equivalent in Canada, cents per mile....	3.05	5.47	4.10	5.90	5.50	3.96	....	4.94	5.09

governed by many factors such as quality and design of vehicle, nature of service performed, mileage performed per year, nature of routes and pavement, efficiency of maintenance and competence of drivers. Operation over rough roads and cobblestone pavement will cause premature body destruction. Heavy standee overloads will cause quick deterioration and failure of chassis and running gear. Incompetent drivers may wreck the engine and running gear while body and chassis remain in excellent condition. Inefficient maintenance methods will quickly result in wreckage of all the parts.

Owing to limited experience in bus operation, it has, so far, been the general practice to apply a flat average rate of depreciation to the vehicle as a whole. Further experience may guide us to the more rational practice of applying different rates to the various main members of a bus. This discussion does not permit of lengthy reference to the many methods that are used for the setting up of depreciation reserve funds. It is sufficient to say that the ultimate end of all these is the same, viz., that by setting aside each year, out of earnings, a sum proportionate to the depreciation in capital value of the equipment, a fund is established for the purchase of new equipment when, through usage or obsolescence or inadequacy or a combination of all these factors, renewals become necessary.

It is generally considered inadvisable that such a fund should be carried as an inert bank deposit. It may be reinvested or drawn upon for other purposes, provided always that it shall continue to earn and be credited with the normal rate of interest and be available for its legitimate use when required.

Owing to the difficulty of differentiating sharply between repair and replacement costs, it is common and perfectly sound practice to combine these costs and to set aside, each year, or when most convenient, specific sums to take care of both. The danger attendant upon this practice is that the setting aside of a sufficient sum to liquidate both liabilities becomes a matter of expediency and, unless the business is very profitable, there is a tendency to set aside an amount which fully covers the actual expense of making repairs but which does not leave a credit balance in proportion to the accrued depreciation.

When there is a clean-cut division made between these two accounts, there is the constant likelihood of minor renewals being made at the expense of the repairs account. These should normally be financed by withdrawals from the depreciation reserve account. Otherwise, this practice will obviously result in an undue inflation of the latter account and the balance sheet will not be a true statement of the financial status of the undertaking.

Furthermore, if a separate account covering interest on equipment is set up, it is obvious that since the depreciation reserve account is earning interest on the depreciated capital value of the equipment, revenue account should only be charged with interest at normal rate on the remaining capital value of the same equipment. In other words, if the income account is being debited yearly with a sum sufficient to cover accrued depreciation, without regard to interest, during the life of the equipment, the credits to interest account should be based on the average value, or one-half of the cost of the equipment. The same end is attained if interest on investment is carried at the full rate and the interests earned by the depreciation fund are credited back to income account.

Regardless of the method employed to attain that end, the principle to be followed is that funds be set up in some way to make necessary renewals of equipment when these are due without having to raise new capital to buy new equipment when the physical assets supporting the original investment have disappeared.

The question as to whether the rate to be applied against earnings to cover depreciation is to be based upon the element of time or upon usage is not of primary importance. If the factors of obsolescence and inadequacy can be ignored, which is seldom the case, there is no doubt that deterioration of physical and capital value will be in proportion to the usage or service rendered by the machine.

If we could anticipate the exact mileage that would be performed each year by a vehicle and could accurately estimate the mileage performance within the economical life of the vehicle, it would make little or no difference which method was adopted. However, since new buses are naturally called upon to do the heaviest part of the work and since the performance of the older buses becomes less and less as time goes on, the application of depreciation charges on a mileage basis has the advantage that the impairment of capital value is being absorbed each year in proportion to the earning ability of the bus. Furthermore, it is easier to estimate the probable ultimate mileage performance of the bus than to estimate the number of years that an old bus will continue to justify its existence in limited service.

Another factor in favor of the mileage basis is that a bus of normal grade and promise of normal life may, through some inherent deficiency, not be as popular as other types, and therefore, not be used to the same extent.

A rate based on a fair estimate of ultimate mileage performance will meet the variations in the usage factor with greater certainty.

Canadian bus operators cannot make direct comparisons of costs with those in the United States. Our fiscal policy dictates that we must pay 40 per cent more for our vehicles than our neighbors. This means that our interest and depreciation charges must also be 40 per cent higher.

The Fifth Avenue Coach Company of New York has had the largest experience of bus operators on this continent. Reference to its financial statements shows that the average proportion of depreciation charges to capital invested in equipment at the end of each year for the past three years is about 14½ per cent. This would indicate an applied rate of about 16 per cent of the average capital value of equipment during these three years.

A comparison of figures available relating to operation in New York, Youngstown and Montreal is of interest.

When comparing these figures it is to be noted that bus practice in New York has been fairly well standardized for several years and that Youngstown figures represent the performance of a fairly large proportion of older and less efficient buses.

Performance in Montreal, so far, indicates that a tapering down of depreciation charges from the existing 20 per cent basis will be quite in order and that a figure of about 4 cents per mile will cover the deterioration of the high-priced, larger vehicles as well as the cheaper and smaller vehicles, which may be expected to deteriorate at a faster rate.

Simplifying Car Inspection*

By J. E. Watkins
Superintendent of Rolling Stock,
Winnipeg Electric Company

PROPER inspection of cars is, as you are no doubt aware, most difficult to have repeatedly performed, as it becomes a routine. To facilitate matters, specific instructions ordinarily are issued, but this appears not to simplify the operation and only to make it more complicated. When the inspector performs his duty, everything should be noted during his passage through the car. A form, similar to the one reproduced, has been found by the Winnepeg Electric Company to be most advantageous, as in starting at the back of the car, beginning with the rear entrance step, he is able to note the defects by inserting a cross (X) opposite the particular one which is found. The safety points, whose condition must be maintained at all odds, are particularly drawn to his attention by black dots.

It has been acertained that better results are achieved by reducing to a minimum the amount of writing on the part of the inspector. This is the reason for inserting a cross only. The manner in which this form is compiled helps greatly in securing a good report.

It is considered by this company a safe and economic system to inspect on the following basis: 750 miles for mechanical defects, 1,500 miles for mechanical defects and lubrication. In

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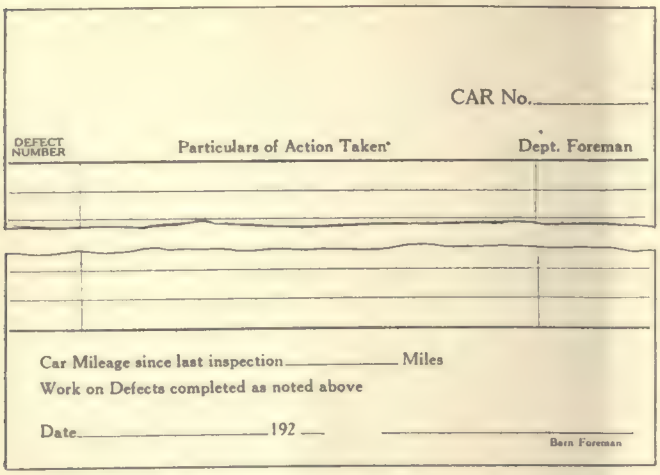
*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.



CAR No.________

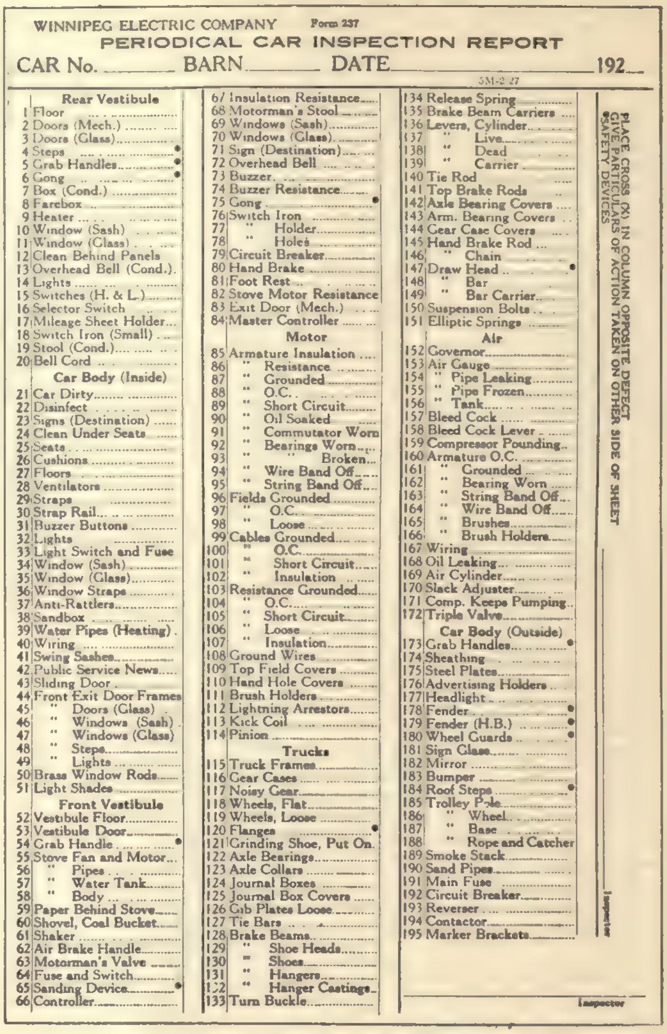
DEFECT NUMBER	Particulars of Action Taken*	Dept. Foreman

Car Mileage since last inspection________ Miles

Work on Defects completed as noted above

Date____________192__ ____________

Barn Foreman



WINNIPEG ELECTRIC COMPANY Form 237

PERIODICAL CAR INSPECTION REPORT

CAR No.______ BARN______ DATE____________192__

5M-2-27

Rear Vestibule
1 Floor
2 Doors (Mech.)
3 Doors (Glass)
4 Steps •
5 Grab Handles •
6 Gong •
7 Box (Cond.)
8 Farebox
9 Heater
10 Window (Sash)
11 Window (Glass)
12 Clean Behind Panels
13 Overhead Bell (Cond.)
14 Lights
15 Switches (H. & L.)
16 Selector Switch
17 Mileage Sheet Holder
18 Switch Iron (Small)
19 Stool (Cond.)
20 Bell Cord

Car Body (Inside)
21 Car Dirty
22 Disinfect
23 Signs (Destination)
24 Clean Under Seats
25 Seats
26 Cushions
27 Floors
28 Ventilators
29 Straps
30 Strap Rail
31 Buzzer Buttons
32 Lights
33 Light Switch and Fuse
34 Window (Sash)
35 Window (Glass)
36 Window Straps
37 Anti-Rattlers
38 Sandbox
39 Water Pipes (Heating)
40 Wiring
41 Swing Sashes
42 Public Service News
43 Sliding Door
44 Front Exit Door Frames
45 " Doors (Glass)
46 " Windows (Sash)
47 " Windows (Glass)
48 " Steps
49 " Lights
50 Brass Window Rods
51 Light Shades

Front Vestibule
52 Vestibule Floor
53 Vestibule Door
54 Grab Handle •
55 Stove Fan and Motor
56 " Pipes
57 " Water Tank
58 " Body
59 Paper Behind Stove
60 Shovel, Coal Bucket
61 Shaker
62 Air Brake Handle
63 Motorman's Valve
64 Fuse and Switch
65 Sanding Device •
66 Controller
67 Insulation Resistance
68 Motorman's Stool
69 Windows (Sash)
70 Windows (Glass)
71 Sign (Destination)
72 Overhead Bell
73 Buzzer
74 Buzzer Resistance
75 Gong •
76 Switch Iron
77 " Holder
78 " Holes
79 Circuit Breaker
80 Hand Brake
81 Foot Rest
82 Stove Motor Resistance
83 Exit Door (Mech.)
84 Master Controller

Motor
85 Armature Insulation
86 " Resistance
87 " Grounded
88 " O.C.
89 " Short Circuit
90 " Oil Soaked
91 " Commutator Worn
92 " Bearings Worn
93 " " Broken
94 " Wire Band Off
95 " String Band Off
96 Fields Grounded
97 " O.C.
98 " Loose
99 Cables Grounded
100 " O.C.
101 " Short Circuit
102 " Insulation
103 Resistance Grounded
104 " O.C.
105 " Short Circuit
106 " Loose
107 " Insulation
108 Ground Wires
109 Top Field Covers
110 Hand Hole Covers
111 Brush Holders
112 Lightning Arrestors
113 Kick Coil
114 Pinion

Trucks
115 Truck Frames
116 Gear Cases
117 Noisy Gear
118 Wheels, Flat
119 Wheels, Loose
120 Flanges •
121 Grinding Shoe, Put On
122 Axle Bearings
123 Axle Collars
124 Journal Boxes
125 Journal Box Covers
126 Gib Plates Loose
127 Tie Bars
128 Brake Beams
129 " Shoe Heads
130 " Shoes
131 " Hangers
132 " Hanger Castings
133 Turn Buckle
134 Release Spring
135 Brake Beam Carriers
136 Levers, Cylinder
137 " Live
138 " Dead
139 " Carrier
140 Tie Rod
141 Top Brake Rods
142 Axle Bearing Covers
143 Arm. Bearing Covers
144 Gear Case Covers
145 Hand Brake Rod
146 " Chain
147 Draw Head •
148 " Bar
149 " Bar Carrier
150 Suspension Bolts
151 Elliptic Springs

Air
152 Governor
153 Air Gauge
154 " Pipe Leaking
155 " Pipe Frozen
156 " Tank
157 Bleed Cock
158 Bleed Cock Lever
159 Compressor Pounding
160 Armature O.C.
161 " Grounded
162 " Bearing Worn
163 " String Band Off
164 " Wire Band Off
165 " Brushes
166 " Brush Holders
167 Wiring
168 Oil Leaking
169 Air Cylinder
170 Slack Adjuster
171 Comp. Keeps Pumping
172 Triple Valve

Car Body (Outside)
173 Grab Handles •
174 Sheathing
175 Steel Plates
176 Advertising Holders
177 Headlight
178 Fender •
179 Fender (H.B.) •
180 Wheel Guards •
181 Sign Glass
182 Mirror
183 Bumper
184 Roof Steps •
185 Trolley Pole
186 " Wheel
187 " Base
188 " Rope and Catcher
189 Smoke Stack
190 Sand Pipes
191 Main Fuse
192 Circuit Breaker
193 Reverser
194 Contactor
195 Marker Brackets

PLACE CROSS (X) IN COLUMN OPPOSITE DEFECT
GIVE PARTICULARS OF ACTION TAKEN ON OTHER SIDE OF SHEET
•SAFETY DEVICES

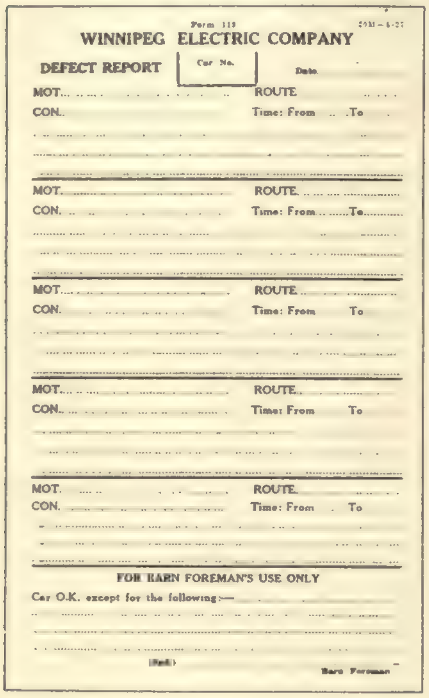
Inspector

Inspector

Above and at right, car inspection form

Front and back of car inspection form used by the Winnipeg Electric Company. Each defect is noted by an X opposite the item. Action taken is shown on the reverse side.

At left, trainmen's form for reporting defects in Winnipeg



Form 119 20M–6-27

WINNIPEG ELECTRIC COMPANY

DEFECT REPORT Car No. Date

MOT. ROUTE
CON. Time: From To

MOT. ROUTE
CON. Time: From To

MOT. ROUTE
CON. Time: From To

MOT. ROUTE
CON. Time: From To

MOT. ROUTE
CON. Time: From To

FOR BARN FOREMAN'S USE ONLY

Car O.K. except for the following:—

(Red.)

Barn Foreman

the case of trippers, once a week for mechanical defects and once a fortnight for lubrication.

The completed report, after inspection, is handed to the shop foreman, who, in turn, passes it to the department concerned. Should more than one department be affected, the sheet is passed on from one to the other or if convenient, all deal with it simultaneously. It is then returned to the head office of the department and retained for a reasonable length of time (usually two years) or unless circumstances occur which may require a longer period of retention.

Reports of defects which are made by the platform men are not always to be relied upon, especially where the defect slip is handed from one to another. They generally do not look for defects, but rely on what the previous operator has found and quote "same as above."

After noting most of the articles which have been written on this subject, it seems that for better efficiency and standardization, pull-in, defect and general inspection forms should be adopted by the Canadian Electric Railway Association and a monthly interchange system adopted, so that we could keep more closely in touch with each property on such matters.

Bus Men Hold First National Meeting

Progress in Organization, Interstate Regulation, Relations With Rail Carriers and Stabilization of Bus Industry Occupy Attention of Rail and Independent Bus Operators at Get-Together Meeting

REGULATION of the motor bus and progress in national organization plans occupied a front-line position in the program at the first annual meeting of the Bus Division of the American Automobile Association held in Philadelphia on June 15-17, coincident with the annual meeting of the parent association. Although operation of buses was given a place on the program, the matter of bringing about unity of action among various classes of bus operators through perfection of the Bus Division's organization, extension of its influence, and the immediate problem of securing a desirable national legislation for the regulation of interstate bus operation overshadowed entirely any operating or technical questions. Considerable attention was given to the relations between independent bus operation and existing steam and electric carriers.

RAIL MEN PARTICIPATE

It was particularly noticeable that the question of relations between rail carriers and intrastate bus operations by the established holders of certificates of convenience and necessity gave rise to very little discussion and that a generous proportion of rail-bus operators were represented in the attendance, on the program and in the councils of the association. Operation of interstate buses, both in long-distance service and in such service as that radiating out of New York City, however, provoked considerable discussion and difference of opinion.

Progress in the organization work of the Bus Division was reported by the secretary and by the chairman of the division's board, A. M. Hill. He outlined the present situation as follows:

"When the Motor Bus Division of the American Automobile Association came into existence, through an organization meeting in Washington on March 19, 1926, the initial membership included twelve state bus associations representing about 1,100 operators and 6,000 motor buses. Today, fifteen months after its organization, the Motor Bus Division is comprised of nineteen state and district associations representative of about 1,900 operators and 16,000 motor buses."

On the outlook for further growth in the near future Chairman Hill said: "The close of this calendar year should see at least 30 state and district associations, representing about 2,500 operators and from 18,000 to 20,000 buses, included in membership."

Organization plans of the Bus Division contemplate membership primarily by state bus associations, although individual operators are eligible to direct membership in the national association under the provisions of the by-laws. Present membership, according to the secretary's report presented at the meeting, is as follows:

State and District Associations—Michigan Motor Bus Association; Oregon Motor Stage Association; Motor Coach Association of Washington; West Virginia Motor Transportation Association; Pennsylvania Bus Association; Motor Carriers Association of California; Illinois Motor Transportation Association; Ohio Motor Bus Association; Motor Bus Association of Virginia; Carolinas Motor Carriers Association; Kentucky Bus Association; Arizona Motor Carriers Association; Southern Bus Owners Association, Inc.; Dakota Motor Carriers Association; Maryland Motor Transportation Association; Oklahoma Motor Truck and Bus Operators Association; Nebraska Bus Operators Association; Wisconsin Motor Coach Association; Minnesota Bus Association.

Individual Companies—Public Service Transportation Company of New Jersey; Florida Motor Lines, Inc.; Orange Belt Motor Line.

BUS REGULATION DISCUSSED

Principles for the establishment of bus regulation were laid down by various speakers. S. A. Markel, chairman of the legislative committee, outlined the history of the division's participation in the effort to work out national regulation for interstate operation. He said that the committee hopes to have its own bus bill, which has been introduced in the House of Representatives, passed at the next session of Congress. In drawing this bill, the important matter of the determination of convenience and necessity for a bus operation was based on the principle that the character of the service to be regulated, should be considered. Mr. Markel also reviewed the recent hearings on bus operation before the Interstate Commerce Commission. He said that the one purpose of the railroads seemed to be to show loss in revenue attributable to bus operation. He maintained, however, that the bus men had been able to prove from the evidence that railroad passenger loss was attributable in large measure to the effect of the private automobile, not the motor bus.

F. O. Sanders, supervisor of bus operation for West Virginia, explained the way in which even interstate operations have been controlled in that state by exercise of the state's police powers, particularly as regards public safety. He said that both bus operators and public officials are pretty well agreed on the need for regulation, the only difference of opinion being as to the extent and character. In West Virginia regulation is not limited to common carrier vehicles operating between fixed terminals, but is applied to all vehicles operated for compensation. He expressed the belief that regulation of common carriers only leaves the road open for irregular operators to destroy the business of those that are regulated.

Concerning the field of bus operation, J. A. Ritchie, president Omnibus Company of America, speaking both as an operator and as a manufacturer, said that operations by his company in New York, Chicago and St. Louis fall into the class of mass transportation. Since the question of the suitability of buses for mass transportation was considered by Mr. Ritchie to be a controversial one, and since the electric railways of the country are the largest existing and prospective operators of this class of service he considered it advisable to leave the final determination of the field of the bus in this class of service to the judgment and experience of these companies. Mr. Ritchie emphasized the importance of the relations between management and men in the successful operation of buses. He declared it exceedingly important that the men be made to feel themselves associates in the business of providing public transportation and that they be encouraged in thinking about the improvement of service by welcoming and stimulating their suggestions.

The principle that the states have a large interest in interstate regulation of buses was declared sound by E. W. Wakelee, vice-president Public Service Corporation of New Jersey. He maintained that in delegating authority to the states under federal legislation care should be taken that the state act under its own authority up to the limit of its powers and as a federal agent only beyond that point.

T. R. Dahl, vice-president the White Motor Company, commented on the constructive character of the discussions and upon the soundness of the principles that had been presented. The general note of accord in the meeting was interrupted by the objections of T. A. Keppler, representing bus operators running to various points out of New York City. He advocated direct federal regulation of interstate operations instead of the delegation of authority to the respective state commissions.

Quoting John Marshall to the effect that, "The power to tax is the power to destroy," R. W. Taggart, president of the nationwide "Yellowway" bus operations, declared that the contention that bus operation in general is not profitable is untrue. He said that many present operators had started with no capital and that their continued existence is in itself proof of the profits made.

Prepared addresses during the meeting were presented by A. J. Brosseau, president International Motor Company; F. J. Scarr, consultant; B. W. Arnold, assistant general manager Chicago, North Shore & Milwaukee Railroad; C. T. McConnell, vice-president Ohio Motor Bus Association; H. G. Wells, public utilities commissioner from Massachusetts, and H. R. Trumbower, professor of economics University of Wisconsin.

Concerning the question of regulation Mr. Brosseau said: "The troublesome question of regulation is as yet unsolved. I am not an authority on the subject, but permit me to point out some elements which I consider fundamental.

"One of the chief virtues of the bus is its mobility. It does not run on rails, but it can go wherever there is an improved road.

"It is not costly to stop, hence it can pick up passengers at any point.

"Rates per mile should not be uniform unless road and other conditions are comparable.

"Regulation should not be based on rail or bus practice of today.

"Elaborate systems, such as apply to rail lines, are not needed.

"Disregard all or part of these factors and you will retard bus development and so hamper it as to deny the public the benefit of its use."

An abstract of Mr. Brosseau's address, together with some of the others presented, will be published in future issues of ELECTRIC RAILWAY JOURNAL.

Correct Wear of Trolley Wire

IN THE report of the Canadian Electric Railway Association meeting, issue of June 11, page 1051, J. F. Neild of Toronto is quoted as saying that with a 25-lb. trolley wheel pressure, No. 00 hard-drawn copper wire should be good for 3,000,000 wheel passes. The figure should have been 2,000,000 wheel passes instead.

American Association News

Entertainment

THE first meeting of the 1927 convention entertainment committee of the American Electric Railway Association was held at the Ambassador Hotel in Atlantic City on June 8. Tentative plans for the various forms of entertainment were discussed, committees were suggested and general plans carried forward so that they may be investigated and reported upon finally at the next meeting of the entertainment committee, which will be held at Cleveland, probably on Monday, July 11.

Chairman Edwin C. Faber presided. Other committee members who were present were Fred Dell, Harry Doyle, J. D. Porter, J. H. Blackhall, John A. Dewhurst, J. R. Welsh, J. O. Kennedy, Fred Bullock representing J. H. Alexander, E. E. Bodin representing Claude Van Auken, S. J. Cotsworth and E. F. Wickwire.

Rolling Stock

FINAL reports of the various special committees on rolling stock were considered by the general committee at a meeting held at association headquarters in New York, June 7 and 8. Those present were A. T. Clark, chairman; W. S. Adams, V. W. Berry, C. Bethel, R. S. Bull, R. W. Cost, M. R. Hanna, J. S. McWhirter, A. D. McWhorter, F. W. Sargent, Hugh Savage, E. S. Sawtelle, D. F. Smith, C. W. Squier and H. S. Williams.

Special committee No. 1 on review of

Manual sections reported on a number of changes which the committee had agreed upon. These included changes in brakeshoe standards, coupler specifications, standard dimensions for height of platforms and bumpers of interurban cars, additional information to the tables of wheels, provision for bolting pads to wheels to reduce noise in operation, location of end connections on cars and additional information regarding installation of connectors used on motor leads.

A tentative report on motor coaches was submitted by special committee No. 2, which reviewed the work of the 1926 and previous reports and included additional information which has been developed in co-operation with the Motor Coach Division of the Standards Committee of the Society of Automotive Engineers and other agencies. An inspection system for gasoline electric motor coaches as used by one large operator was submitted.

In the tentative report of special committee No. 3 on car equipment attention was given to improved design as incorporated in the new Springfield and Joliet cars and to advances made in streamline painting.

The report of special committee No. 4 on lighting contained a review of the principal conclusions as presented in the 1926 report and included revisions and additions for a more comprehensive treatment of the subject. A section on recommended practice contained a discussion of suitable lamps and reflectors for car lighting, together with illustrations of typical lighting units, and plans showing proposed arrangement of outlets. A table showing comparative demand for standard street railway lamps during the years 1925 and 1926, together with a review of recent developments in lamps for electric railway service, was given in an appendix of the report.

Special committee No. 6 on lubrication presented a tabulation of answers to a questionnaire which had been sent out. The report will be revised and put in standard form.

A complete report was presented by special committee No. 7 on air compressors. This will be sent out for letter ballot to the members of the committee.

Special committee No. 8 on motor brushes reported on a program which had been previously outlined. This is being carried out and a progress report will be presented this year.

Particular interest was shown in the report of special committee No. 9 on noise reduction. A number of tests have been conducted on various equipment parts to show how different types of installation can reduce noise.

Special committee No. 10 on gearing presented a tentative report with certain recommended changes in existing specifications.

Special committee No. 12 on journal boxes reported that recommendations would be made for doing away with thrust plates and omitting the lugs for holding these in journal boxes.

Special committee No. 13 on limits of wear is making substantial progress toward recommending limits of wear that will reduce the spreading of gear centers.

Special Rolling Stock Committee No. 1

SEVERAL important decisions regarding changes to standards and specifications as they now exist in the Manual were decided upon at a meeting of special rolling stock committee No. 1, held at association headquarters, New York City, June 6, 1927. Those present at the meeting were C. W. Squier, chairman; W. S. Adams, H. S. Williams, members of the committee, together with representatives of coupler manufacturers, H. E. Van Dorn, John Keegan, D. C. Davis, A. E. Heffelfinger, A. L. Price and H. W. Gilbert.

The morning session of the committee was devoted to a discussion of couplers. Revisions to the recommended specifications, serial No. E 100-12, were decided upon. In reviewing the specifications various comments from manufacturers were received. Those present felt that a large amount of work should be done in collecting additional information and developing standards for couplers. To develop them properly a special committee was recommended to be appointed consisting of various manufacturing representatives as well as operators of interurban railways.

New designs of brakeshoes were decided upon by the committee. They give more space in the grooved section of the shoe which fits over the wheel flange. This was considered desirable to provide for worn wheels.

Standard dimensions for heights of platforms and bumpers of interurban cars were discussed by the committee and certain changes were agreed upon. Changes in the specifications and tables for wheels were also agreed upon. It was recommended that a note be added to the effect that the hub diameters given in the tables should be looked upon merely as maximum limits to take care of eccentric bores. Specifications should govern the inspection and acceptance of wheels. To provide for bolting of pads to wheels to reduce noise in operation, the committee recommended that four holes be added to the present wheel design.

A new drawing for the location of end connections was presented. This will be included in the committee's final report. The miscellaneous method in practice on motor leads was reviewed and the committee recommended that more definite information be given regarding approved practices for insulating motor lead connectors. Several other specifications, which are now included in the Manual, were gone over and suggested changes were considered, but as additional information was required to give proper study, no changes were decided upon.

Way and Structures

REPORTS of nine special committees were read at the third meeting of the committee on way and structures, held at association headquarters, New York City, June 9 and 10. Subjects covered included review of existing standards, track ballast and drainage, rails, arc welding, special alloy steels other than manganese, effect of rubber-tired vehicles on pavement, bus garages, light grooved girder rail and standardization of switch tongues. Members present were H. H. George, chairman; A. T. Spencer, C. A. Smith, C. A. Alden, H. F. Merker, W. G. Hulbert, W. W. Wysor and C. F. Gailor, chairman of the special committee on arc welding.

Education

ON JUNE 14 an all-day session of the committee on education of the American Electric Railway Association was held. The program for the annual report was decided on and the work at the coming convention was discussed. Following the foremen conference demonstration of last year it is planned this year to conduct a six-day school, four hours each morning of convention week from Monday until Saturday inclusive, at which delegates from companies may receive instruction as to how to conduct foremen conferences. It was tentatively planned to have this group led by H. H. Norris of the Boston Elevated and A. J. Sarré of the New Orleans Public Service, Inc., calling on Frank Cushman as an adviser, critic and instructor. Mr. Cushman, of the Federal Board for Vocational Training, Washington, D. C., is well known for his educational work in industry, with particular relation to the conference method of foreman training. Both Professor Norris and Mr. Sarré have used this method on their respective properties for years. The work will be conducted alternately by these two men, holding several conferences each morning. At the close of each Mr. Cushman will criticise and make suggestions based on his observations.

Further data and application forms will soon be sent to member companies in order to enroll applicants for this training work in advance of the convention. In order to obtain the best results the group will be limited probably to 50 members.

The committee's report was essentially completed. It will contain a review of the educational activities of the member companies that have responded to the questionnaire sent out by the committee earlier in the spring.

At the meeting H. H. Norris presided for Edward Dana. Other members present were J. F. Hyatt, A. J. Sarré, A. B. Gibson, H. H. Fenton representing W. H. Boyce, John A. Dewhurst and J. W. Welsh.

Traffic Congestion

WITH a few minor alterations the preliminary draft of the report of the committee on traffic and safety was unanimously approved by the members present at a meeting held at association headquarters June 9. It was decided to send a message of appreciation to C. H. Evenson, chairman, for the work he did in preparing the report. Members present were A. J. Fink, F. L. Butler, R. W. Emerson, J. P. Ingle, Deane Locke, J. A. Miller, Jr., E. C. Spring and Samuel Riddle of the Transportation and Traffic Association and H. K. Bennett, Seth W. Baldwin and A. G. Jack of the Claims Association.

The News of the Industry

Little Progress in Toledo

Prospects Not Bright for Settlement of Franchise Matter Before 1928 —Terms of Grant Unknown

Hope for the passage of a new franchise in Toledo to amend and correct defects in the present Milner service-at-cost plan to be put into effect before the beginning of 1928 is rapidly passing.

Representatives of the Henry L. Doherty & Company interests, including Frank R. Coates, president of the Toledo Edison Company and the Community Traction Company, Toledo; Dewey C. Bailey, special counsel, and R. E. Burger, chief of the utility division of Cities Service Company, have been in several meetings with the members of the street railway board of control in Toledo recently, but an agreement has not yet been announced and no franchise will be ready for submission at the August primaries.

The local political situation and the mayoralty election preclude submission at a general election and so the present plans would seem to contemplate the working out of the details of a new arrangement to submit to the voters at a special election late in November or early December.

Definite announcement of the terms of the new ordinance are not available, but the tenor of the conferees indicates that the new grant will provide the company with an exclusive franchise for bus and railway service for a period of ten years. The board of control is being asked for concessions by way of the writing off of the accumulated deficit of more than $1,000,000 and bringing in of probably $1,500,000 of new capital without increasing the outstanding securities of the Community Traction Company.

Work has started on the repair of the St. Clair Street tracks in the downtown section, forced upon the company by the city administration so that new paving could be laid on that street. Abandonment of these tracks was provided in the original Riggs plan. This move is taken to indicate that complete solution of existing problems is still many months away.

The City Council has also passed an ordinance which will give to private bus lines a two-year operating privilege, a move which some contend may block the city from granting exclusive transit privileges for two years. However, this ordinance has not been signed by Mayor Fred J. Mery and is not enforceable for some time. Its enforcement will be in the hands of the city administration, which is in accord with the negotiations being carried forward by the railway board of control.

It will be recalled that the franchise settlement ordinance, which was prepared by Dewey C. Bailey and Law Director Frank M. Dotson and received the approval of Prof. Henry Riggs and Attorney Newton D. Baker, was rejected by the board of control and a business men's committee of the Chamber of Commerce. That measure is considered definitely out of the picture in the solution of problems.

The power purchase question, which has been particularly knotty under the Milner ordinance, is believed to be solved on the basis of Professor Riggs' plan, but it will be put into effect only in the event of the solution of other franchise problems.

New Tariff in Buffalo

Ten-Cent Cash Fare in Buffalo Depends Upon Carrying Out Program of Reconstruction—Rate Base on Which Company Is Allowed Return Fixed at $23,261,558

THE Public Service Commission authorized the International Railway to file a new tariff of fares in Buffalo, N. Y., to be effective July 1, 1927, fixing the adult fares at 10 cents cash, three tokens or tickets for 25 cents and 3 cents for children's fares, between the ages of five and twelve years. The order of the commission is contingent upon the agreement of the company to carry out diligently and in good faith a reconstruction program, beginning with the reconstruction of tracks and repavement of Grant, Seneca, East Ferry and Smith Streets and Fillmore Avenue, the estimated cost of which is $947,703.

On Sept. 15, 1926, the International Railway proposed to increase fares in Buffalo to 10 cents for adults and 5 cents for children, to be effective Oct. 16. The commission refused to accept the new tariff and instituted an exhaustive investigation into fares, revenues and operations of the railway, inasmuch as complaint had been filed by the city with the commission as to service, condition of equipment, operation of one-man cars and condition of the roadbed. The city and company both filed exceptions to the report of the commission's accountants and very little further testimony was taken, so the questions are decided substantially on the records of the commission brought down to recent date by the reports of the accounting and engineering divisions of the commission.

The rate base arrived at by the commission, applying to the city of Buffalo only, and upon which the company is entitled to a return for investment, is $23,261,558. The estimated revenues and operating expenses, including taxes, for 1925, and on which the present fare is based, would have left available for return on investment $1,850,061. The increased fares authorized at that time, however, failed to produce the revenue estimated, the actual return for 1925 being $1,664,497. Failure to earn the estimated revenue was due to the decrease of passengers, which had been anticipated, but not to the extent occurring. There was some decrease in operating expenses.

The commission estimates that the increased fares now allowed will produce a net return of $1,961,144, with which the company should be able to pay interest on its funded debt and other fixed charges against its income, and with the application of at least part of the annual accrual to its reserve for depreciation should carry out the reconstruction program outlined.

Commissioner Pooley, who conducted the investigation for the commission, says in his memorandum:

> The city of Buffalo is vitally interested in its street railway transportation. A large amount of track reconstruction and repaving appears to be necessary now and in the near future. The projects demanded by the city and now imperative involve an expenditure on the part of the company of upward of $2,500,000 without taking into consideration construction work demanded every year.

In his statement accompanying the report he said it was unfortunate that fares in Buffalo had to be again increased. The commission was desirous of lending its co-operation for the betterment of the transit situation in Buffalo, and to that end would, upon request of the city authorities, arrange and conduct conferences between the city and company officials. It might be that certain improvements or extensions are contemplated or desired by the city and that its authorities may wish to give other street improvements priority over some of the projects covered by the commission's program. There should, too, be a further program for reconstruction and repavement, and the subject matter of the various court actions now pending might be considered and further useless and costly litigation avoided. All of these and other matters might well be discussed at the above suggested conference, which will be arranged by the commission promptly on receipt of advice that the city authorities desire to co-operate.

Improvements Carried on Apace in Milwaukee

Chief current activities in the transportation branch of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., are addressed to improving car and bus service within the metropolitan area and to transforming the company's old interurban lines into rapid transit, de luxe lines. The Waukesha - Oconomowoc - Watertown line, thus transformed last year, is popular and successful. Rapid transit de luxe car service on the Burlington-East Troy lines will be opened early in the summer of 1927. On completion of this plan, Milwaukee Electric will give Milwaukee, for the first time in the city's history, swift and luxurious suburban passenger service southwest and west on its own lines, and north along the lake shore on the Milwaukee Northern —a service which will be a large factor in promoting outward industrial and residential growth of the Greater Milwaukee district.

Aurora & Elgin Increases Efficiency of Freight Service

By the adoption of improved methods, the Chicago, Aurora & Elgin Railroad has brought about faster handling of carload freight traffic, affording substantial economies in operation, including a reduction in per diem costs for foreign line cars on its rails. Based on the experience of the first month's working of the new plan an annual saving of approximately $30,000 is estimated by company officials. The change from former practice was made on Feb. 1 last, when a car service section of the transportation department was established at Wheaton, Ill., at the instance of Col. Edward J. Blair, general manager.

Since that time the average number of car-miles a day has increased some 29 per cent, compared with a similar period of 1926, resulting in a more expeditious movement of carload freight and permitting more efficient utilization of existing facilities. The ratio of empty freight car-miles to total freight car-miles has been lowered from 56 per cent to 33 per cent, incidentally reducing proportionately the operating cost of handling cars in non-revenue movement.

Rates Changed in Houston

Ten-Cent Cash Fare, Token Fare and Nickel Pass to Meet All Demands—More than $1,000,000 to Be Spent for Improvements in Year

ADJUSTED rates for the Houston Electric Company, Houston, Tex., effective June 13, call for 10-cent cash fares, tokens four for 30 cents and the weekly "nickel pass," introduced first at Fort Worth several months ago. The change in rates is from a 7-cent fare with 6¼-cent token rate and 3⅛-cent token fare for children. The new rate for children will be 4 cents.

Improvements during the next twelve months are to cost $1,000,000. These include the purchase of new cars and buses.

"Ride more for less per ride" is becoming the new sales slogan of the traffic superintendent. For the person who rides the street cars twice a day the average cost will be 6.79 cents per trip, just a little less than the present cash fare and slightly higher than the present tokens.

When shown to operators of the Houston Electric Company the holder of the "nickel pass" will be entitled to ride on all equipment, including the express buses, for the payment of a 5-cent fare. The passes will be issued weekly and will sell for 25 cents. Issued on Sundays, the passes will become valid the following day. If purchased any day after Sunday, the price is to decline at the rate of 3 cents per day. Thus the rider who does not purchase his pass until Wednesday pays only 19 cents for it and may ride cars or buses for an additional 5 cents per trip. When the pass is used three times a day or 21 times per week the cost per ride will drop to 6.19, or less than the tokens; for four rides a day the average cost will be 5.89 cents, and for five times a day, or 35 times a week, 5.71 cents.

Manager Jeff L. Alexander petitioned the City Council on Feb. 28 for an adjustment in rates as the Houston Electric Company was about to fulfil certain promises made in a "citizens' agreement" four years ago, when jitneys were abolished by ordinance. During the life of the agreement the company co-ordinated its railway and bus service and made other improvements, the total cost having reached $1,650,000. In suggesting a 10-cent cash fare with 8⅓-cent tokens and 35 cents for the "nickel pass," the company compromised for the new rates. Lowering the initial cost of the pass, it is believed, is likely to cause too great a reduction in car fares, though the plan will be thoroughly tested. Mr. Alexander and other officials of the company hail the new plan as one which will prove popular with the most frequent customers, through lowering their fares, and giving the mass riders during the rush hours a reasonable rate which will justify such improvements as are needed. It is only the infrequent rider who must pay the 10-cent cash fare.

Collect-on-Delivery Service in Indiana

A new collect-on-delivery service between all agency stations of the Union Traction Company of Indiana become effective on May 25 as a feature of the company's merchants' dispatch express freight service. Heretofore shipments have been accepted only on straight billing with no provision for collection on delivery. The service, for the present, will be confined to agency stations on the traction lines, 68 in number, including the Indianapolis station.

Rehabilitation of Ohio Property to Be Commemorated

The Cincinnati, Hamilton & Dayton Railway, Dayton, Ohio, plans a private inspection, dinner and celebration on June 22 to commemorate the rehabilitation of the property of the company. In general the program is as follows:

Inspection of a portion of the property, using for the first time the new interurban equipment now under construction.

Inspection of a typical new power substation.

Inspection of the new car shops and offices at Moraine City.

Dinner at 6:30 p.m. at the company's new offices and car shops, Moraine City, immediately south of the Frigidaire plant.

Public cremation of old cars—the passing of the old; the advent of the new.

Fireworks display in conjunction with new and novel airplane night flying by the flying section of Wright Field, Dayton.

There will be in attendance at this community celebration of the rebirth of one of Ohio's leading interurban railways a selected group of prominent citizens of the Miami Valley as well as people prominent in New York, Philadelphia, Chicago, Pittsburgh and elsewhere.

Ten Cents Ordered in Albany on July 1

Car fares in Albany, N. Y., and the Capitol District are to be increased from 7 to 10 cents on July 1, by order of the Public Service Commission issued on June 15. The increase is effective on all lines of the United Traction Company serving, besides Albany, the cities of Troy, Cohoes, Watervliet and Rensselaer and the Villages of Green Island, Menands and Waterford. Under one provision of the ruling, however, the company must sell tokens at the rate of thirteen for $1. Fare for children, however, is increased from 3 to 5 cents. Transfer privileges are to remain as under the present tariff.

The decision of the commission in granting the increase was written by William A. Prendergast, Republican chairman, with three other commissioners concurring. Commissioner Lunn of Schenectady, Democrat, dissented.

No decision has been made in the case of the Capitol District Transportation Company, operating buses over streets in the same cities and which filed application before the commission for a 10-cent fare. The commission pointed out that the traction case decision was not to be construed as having any bearing on the decision rendered in the case of the bus company, a subsidiary of the United Traction Company.

In addition to awarding the increase asked by the traction company, the majority opinion refused to grant segregation of the company's properties, for which attorneys for the city of Albany had contended long and bitterly at hearings before the commission.

Two points of importance over which Mr. Lunn disagreed with the other four commissioners in the traction company case were valuation and segregation. Mr. Lunn held the traction company in arriving at a valuation basis of its property on which fares were to be determined "disregarded all elements that entered into the determination of valuation except that of replacement costs."

The only evidence presented, he said, was that of present reproductive cost of its entire property undepreciated.

Segregation of the company's properties as a basis for determining the rate of fare that should prevail in each city separately was considered of vital importance in the proceedings.

Wages Still an Issue in Toledo

Deadlock over the wage issue in the new contract which representatives of the Community Traction Company, Toledo, Ohio, and the union has held back a settlement for nearly two weeks. Every other point has been adjusted. The company has offered the men $5 a day minimum wage with $120 a month guaranteed to all extra men, with the old hourly wage scales in effect and some concessions on the part of the men as to working conditions.

The men want an increase of 10 cents an hour over the present scale of 50 cents for the first nine months, 52 cents for the next three months and 55 cents after the first year of service.

There has been considerable talk of a formal arbitration, but this would throw all conditions of the contract into the issue.

The old contract expired on May 31, but any changes which may be included in the new contract will be retroactive.

Philadelphia Subway Bids Will Be Opened July 19

Bids for extending the South Broad Street subway of the city of Philadelphia were called for June 10 by Henry E. Ehlers, Director of the City Transit Department, in whose office they will be opened on July 19. Unofficial estimates place the cost at $20,000,000. The specifications call for a continuation of traffic throughout the subway construction. Laying of rails, installation of electrical equipment and repaving of South Broad Street are not included in the construction contract. The length of the extension, known as Contract No. 109, is 3,020 ft. Transit department engineers estimate that there are 372,000 cu.yd. of excavation, 54,000 cu.yd. of concrete, 11,700,000 lb. of structural steel, 1,400,000 lb. of reinforcing steel and about 1,200 tons of cast-iron pipe included in the contract.

Property Owners and City Confer on Chicago Subway Problems

Downtown property owners and city officials of Chicago conferred for the first time a few days ago on the problem of subway construction. Addressing the meeting in behalf of the Lake Street Property Owners' Association and Wells Street District Property Owners' Association, H. L. Ressman, president of both organizations, offered renewed assurance to the city of their readiness to stand equitable special assessment for subways to be built wherever expert engineers should declare them most beneficial. In return for this support he asked that the city government pledge itself to remove the present sunlight-obscuring and noisy elevated structure from the Loop district as a part of the traction-subway program. The two associations represent approximately 80 per cent of the property owners on Lake Street and Wells Street in the downtown district.

While predicting the ultimate removal of the structure, Michael J. Faherty, president of the Local Board of Improvements, told the property owners that such a step would still be a bit premature and that they would have to consult with Samuel Insull, chairman of the Chicago Rapid Transit Company, which holds a 50-year franchise in the Loop, if they wanted the structure torn down.

With the co-operation of property owners thus assured, Mr. Faherty declared, the city would not be hindered by lawyers employed to attack the legality of spreading the cost of building the tubes between themselves and the city as a whole. The absence of legislation authorizing subway construction by special assessment, he added, is the only thing that is delaying the actual work. Traction bill No. 1, now awaiting action in the General Assembly at Springfield, is designed to give the city full authority in this matter.

Employees of South Shore Line Win Better Business Prizes

Cash awards totaling $300 have been received by twenty employees of all departments of the Chicago, South Shore & South Bend Railroad for their successful efforts in obtaining new business for the company during the first 60 days of the current year. The initial prize winners in the company's better business campaign, which was launched early in January, were picked from those showing the greatest efforts and results as represented in the number of revenue-producing tips turned in to the traffic department. During the first three months of this year 150 employees, or 25 per cent of all who are eligible, sent in one or more tips. The total number of tips received exceeded 1,280. Prizes totaling $300 will be awarded every 60 days throughout the year.

Charles Derrico, winner of $100 prize in South Shore's better-business campaign

Business gained through this campaign, according to the committee on awards, showed very favorable totals and as the campaign continues even greater results are anticipated.

Recapture of New York City Lines Discussed

James L. Quackenbush, general counsel for the Interborough, and former Gov. Nathan I. Miller, special counsel for the Brooklyn-Manhattan Transit Corporation, will be furnished with maps and other data showing in detail the tentative plan for a new city-owned subway system prepared by Col. William C. Lancaster, chief engineer of the State Transit Commission, and submitted at the transit readjustment hearing of the commission on June 10.

This tentative plan provides a system formed by a combination of the subways now under construction and contemplated, and the recapturable lines of the Interborough and B.-M.T. The series of maps presented by Col. Lancaster showed a subway system of 146 road miles which he said would form a complete system. He said it contemplated the recapture of all the B.-M.T. subways and the West End elevated extension, and the east side subway and the Interborough's Queens extension.

The plan contemplates an expenditure of $178,000,000 for recapture purposes—$52,728,000 for the desired portions of the B.-M. T. and $126,000,000 for the east side branch of the Interborough and its extensions to Queens.

Mr. Lancaster testified such a merger would produce a "very complete system," extending into all boroughs except Richmond.

While it was made plain that the commission has not in any sense approved this proposition as a whole, it became increasingly apparent that any plan is almost certain to include recapture of certain properties as a feature. The lines recaptured probably will be determined eventually by the attitude of the companies.

It was testified the B.-M.T., including equipment, has expended $49,232,000 on development of its subways, and that its deficit on its investment had been about $16,000,000, including its preferential of $3,500,000 a year. Including elevated extensions and third tracking, the whole investment under Contract No. 3 was brought up to $89,000,000. F. W. Lindars, accountant for the commission, said it would cost only $67,000,000 to recapture all those portions which can be taken back under the contract. The city's deficit on the B.-M.T.—loss of interest and sinking fund—Mr. Lindars figured at $47,000,000, bringing the total city investment in the road to $214,500,000.

The Interborough situation is different. The city's investment under Contracts 1, 2 and 3 totals $176,000,000, while the company, including cost of elevated extensions and third tracking, has chipped in $210,710,000. One curious thing brought out was that under the Interborough contracts the elevated extensions and third tracking are recapturable, but the road cannot be operated by the city.

Mr. Lancaster testified lines now being constructed by the city plus the portions proposed for recapture of both the private lines would provide a system with 146 road miles, leaving the Interborough with 71, and that the new system would be 27 miles longer than the combined systems, which would be left with only 119 miles between them.

"Carhouse" Cars Carry Passengers in Cincinnati

The unpopular "Barn Only" sign has been abandoned by the Cincinnati Street Railway, Cincinnati, Ohio, and plates lettered "Hyde Park Carhouse" or lettered for other carhouses have been substituted. This change has a psychological advantage. When a prospective car rider sees a "Barn Only" sign on the front of an approaching car he steps back, feeling that the car is out of service, when actually it will take passengers to any point up to the carhouse. With the new method, persons whose destinations are anterior to the carhouse will feel free to board those cars. The practice of using these cars has also been stimulated by notices through the press to the effect that carhouse cars will carry passengers at all times. An additional feature of these signs is that they are painted on the reverse side of the regular route number plates. All cars assigned trip numbers from a given carhouse will return to that carhouse at the end of the run. By this system one more sign is eliminated from the front of cars.

Mitten Building Replaces Equitable Building in Philadelphia

Mitten Management has purchased the Equitable Building, at the northwest corner of Broad and Locust Streets, Philadelphia, Pa. The total cost of the building was approximately $6,000,000, of which $4,300,000 is well placed on mortgage at a low rate of interest.

The Equitable Building will, in the future, be known as Mitten Building, and in addition to housing all of the Philadelphia Rapid Transit Company's office activities will also house the industrial section of the B. of L. E.-Mitten Bank, of which the principal office is at Market Street and West City Hall Square. Mitten Bank Securities Corporation will also have its headquarters in this building, at which point its executive vice-president, W. K. Myers, will be located, as also will the general offices of Mitten Management. Inc.

Another Piedmont & Northern Hearing June 20

Permission to intervene and become a party to the proceedings of the Interstate Commerce Commission in the matter of the application of the Piedmont & Northern Railway for a certificate of convenience and necessity to complete the proposed extensions of the lines in North Carolina and South Carolina has been asked by Gov. John C. Richards, the South Carolina Railroad Commission and Attorney-General John M. Daniel. They feel the establishment of the additional service is required by public necessity.

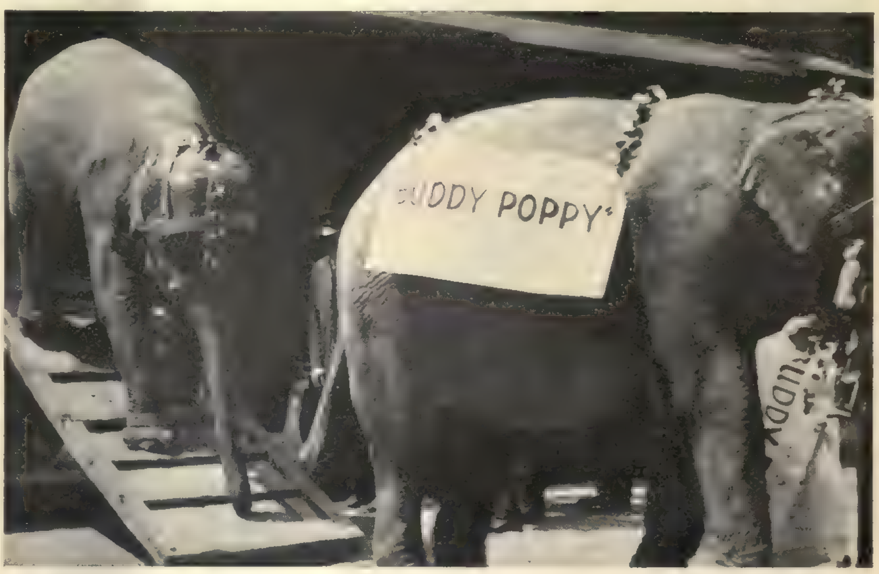
The Interstate Commerce Commission has ruled that it had jurisdiction over the Piedmont & Northern line and the petition for permission to construct the extensions now is in the hands of the commission.

The Southern Railway and the Seaboard Air Line Railway are opposing the construction of the new line. The lines proposed from Spartanburg to Gastonia and from Charlotte to Winston-Salem parallel the Southern Railway most of the way.

The question of the authority of the Interstate Commerce Commission over the Piedmont & Northern will be one of the matters to be heard on June 20.

A New Wrinkle! In Fact, Several of Them!

Ever alert to opportunities for civic help, the Pittsburgh Railways, Pittsburgh, Pa., received quite a bit of publicity during the latter part of May when the company hauled three young but husky elephants from their apartment at Kennywood Park (Pittsburgh's largest amusement park, about 10 miles from the city) down to the business section of Pittsburgh, where they were put through various stunts by their trainers in front of the railway company's office building.



Parade of pachyderms at Pittsburgh promotes purchase of poppies

The occasion was "Poppy Day," held throughout the Pittsburgh district by the Veterans of Foreign Wars. In order to stimulate the sale of poppies and to advertise the park, the Kennywood management offered the elephants for display on Saturday morning.

The railway helped out by furnishing a freight car for free transportation between the park and the city.

Additional Authority for Dr. H. E. Fisher

Standardization of employee medical service on the four electrically operated railroads in the Chicago district under the management of Samuel Insull and associates was announced with the recent appointment of Dr. Hart E. Fisher as chief surgeon of the Chicago, Aurora & Elgin Railroad and Chicago, South Shore & South Bend Railroad. Dr. Fisher has been in charge of the medical department of the Chicago Rapid Transit Company, Chicago, North Shore & Milwaukee Railroad and Public Service Company of Northern Illinois for several years.

Zero Hour a Success

Trainmen of the Georgia Power Company, Atlanta, Ga., have completed a series of eighteen "zero hours" over a period of as many days without an accident. With 400 street cars and 1,200 trainmen employed, only one accident was reported, and that was an automobile accident not affecting the street car. The drive started on May 9, when "zero hour" was set at from 6 until 7 o'clock in the morning. Thereafter "zero hour" moved up one hour each day until the conclusion of the safety campaign on May 26, when it came from 11 to 12 o'clock in the evening. Each day notices were posted at every carhouse giving the time of "zero hour." Similar notices were posted in all of the cars of the company, so that every employee knew when the hour came each day. The city safety council and other agencies co-operated in informing the public on "zero hours."

No Lower Fare for Boston & Worcester Railway

The State Department of Public Utilities of Massachusetts has dismissed the petition of the patrons of the Boston & Worcester Street Railway for a lower fare. The road is now selling zone tickets allowing 66 rides for $2.50, and the department suggests that the receiver for the company might well issue tickets for 26 rides for $1 to obviate the necessity of patrons tying up a large amount in tickets, but declined to order him to do so. In the order, the department states:

> It appears that the railway, since the receivership, has been operating at a deficit and that the increases in fares were made in the hope of cutting down the deficit. A receiver is ordinarily appointed to the interest of creditors. He is an officer of the court and his acts are subject to the control of the court. We are of the opinion that we have jurisdiction to order reduction in rates established by a receiver where they are manifestly unreasonable. It ought, however, to be a very plain case to justify such action on our part. Such is not the situation in the fares complained of.
>
> We think the receiver might well consider the advisability of issuing tickets good for 26 rides for $1.

New York Mayors Discuss Paving, Bus Regulation, Traffic Control

The New York Electric Railway Association through its secretary, William F. Stanton, asked the New York State Conference of Mayors at its eighteenth annual gathering in Niagara Falls to appoint a special committee to meet with a similar committee from the association in an effort to come to an understanding over paving between tracks. As a result it has been agreed to meet representatives of the railways at some future time and discuss the form legislation should take. Mayor Samuel A. Carlson, Jamestown, president of the conference, will hear any suggestions the railways may advance in respect to changes in the law and later in the year a special committee will be appointed to discuss the problem in greater detail.

William P. Capes, secretary of the conference, indicated that no concessions would be made which would be to the disadvantage of the cities or the taxpayers. The railways are seeking a change in the law which would obligate them to repave only those portions which, it could be proved, have broken down under railway traffic.

Motor bus regulation presented another topic for discussion at the Niagara Falls conference. Mayor Carlson said state laws are inadequate and that lack of governing power is producing a very unsatisfactory situation. The association went on record in favor of instituting a study of bus regulation in co-operation with the New York State Public Service Commission and the New York Electric Railway Association. Another recommendation was enactment of an amendment to the general highway law to provide uniform traffic regulations by control signals.

Mayor Walker of New York urged the Mayors to support the $300,000,000 debt limit extension for credit for subway building in New York City by encouraging the voters of their cities to cast their ballots in favor of the debt limit amendment. According to Mayor Walker the purpose of the amendment is to provide that whatever sum, up to $300,000,000, the New York City authorities decide to expend for the construction of new subways shall not be included in calculating the debt limit of the city. In other words, it provides that the credit of the city of New York, in the development of its transit facilities, shall be extended in the sum of $300,000,000.

San Francisco Extensions Fail to Carry

San Francisco voters at a special bond election on June 14 refused to approve two municipal ownership measures. The proposals were to buy the privately owned Spring Valley Water system for $40,000,000 and to spend $4,700,000 for municipal railway extensions. They failed to receive the necessary two-thirds vote. Friends of the two measures blame the light vote for their defeat. Out of a total registration of 225,000 only 73,117 went to the polls. The vote recorded on the railway bond issue was 44,305 yes votes and 28,888 no votes. The proposal to build the Bernal cut carried. This is a surface tunnel in the Mission district, linking that district with the new Excelsior district, now served by the Market Street Railway. Use of this cut is desired by the Municipal Railway.

New Texas Road to Open

Passenger service over the new Houston North Shore Railway between Houston and Goose Creek, Tex., is announced to begin on June 19. The line is 32.5 miles long and penetrates territory hitherto without rail facilities. Control of the road is understood now to lodge with the Missouri Pacific Railroad. Power for operation will be supplied by the Houston Electric Company.

Owen D. Young Heads Delegation to Stockholm

Owen D. Young, chairman of the board of the General Electric Company, will be the chairman of the American delegation to the Stockholm meeting of the International Chamber of Commerce, June 27 to July 2, it was announced recently by the American section. The American delegation will be made up of more than 150 leading business executives, representing different lines of industry, finance and commerce.

The conference will be in session six days, during which time the delegates will endeavor to work out a solution of some of the problems which are retarding the development of international commerce. For the purpose of technical discussion, the meeting will be split into four groups: Finance, Trade Barriers, Industry and Trade, and Transportation and Communications. The American participation in each group will be under the general direction of a committee of the American delegation.

Sightseeing in Portland.—A recent number of *Watts Watts*, the house organ which the Portland Electric Power Company, Portland, Ore., distributes through pockets on the street cars, is a tourist number containing information on places to go in the vicinity reached by the street cars. This company runs two sightseeing cars each day during the summer, touching all interesting points in the city. The fare is 50 cents and the trip consumes about 1½ hours.

Municipal Control Sought.—Bakersfield, Cal., may join the ranks of cities having municipal control over transportation system, if plans of the Bakersfield Realty Board are carried out. Action was taken recently at a meeting in a move to have the city take over control of the Bakersfield & Kern Electric Railway. Sentiment in favor of the municipal control idea followed the failure by the Realty Board to induce the railroad to extend its line into the southern part of the city, territory the railway considered unprofitable.

Verdict Won by Traction Company.—An award of $400 was made to the Morris County Traction Company, Morristown, N. J., on June 7 in its suit against the Dispatch Motor Express Company of Newark. The suit resulted from an accident in Main Street, Rockaway, when a truck of the Dispatch Motor Express Company crashed into a trolley car. This is the third verdict recovered by the Morris County Traction Company during this term of court, two verdicts for damages to its equipment by autos having been secured previously. In addition to these verdicts the company has collected damages in seventeen cases where the cars and autos were in collision during the first six months of 1927. The judge remarked to the jury in the last case that a railway should receive the same consideration in a case as if an individual were suing the company.

Seeks Fare Increase.—The Central California Traction Company has applied to the Railroad Commission for permission to increase its local fare in the city of Sacramento, Cal., from 5 cents to 7 cents per passenger.

Northwestern University Gives Summer Public Utility Courses.—The Northwestern University School of Commerce, in Chicago, announces that it will, as heretofore, offer two courses of instruction in public utilities during the summer session of 1927. These courses will afford an opportunity for a full program of work for those interested. The course in principles of public utilities will be offered by Prof. James P. Adams of Brown University and the graduate seminar will be under the direction of Prof. H. B. Dorau. Northwestern University School of Commerce during the regular school year offers a large number of courses, both graduate and undergraduate, dealing with every aspect of the public service industries.

Reduced Tickets for Sale. — The Springfield Street Railway, Springfield, Mass., placed in operation on June 5 a reduced rate round-trip ticket selling for 30 cents between Springfield and Riverside Park, good on the cars and buses to and from the park. However, no transfers are issued or accepted on the buses. The tickets are effective up to and including Sept. 10. Tickets will be sold by conductors and operators only on the cars or buses.

Theater Makes Refund.—For the week of June 6 patrons of the Nashville Railway & Light Company, Nashville, Tenn., were offered free rides by the Capitol Theater management. Introducing this offer a few weeks before, the theater gave round-trip carfare to hundreds of persons who visited the playhouse. All the patrons had to do was to present a coupon to the box office of the Capitol Theater when the theater tickets were bought and the 14-cent refunds were made.

Ten Cents Until 1931.—The Public Service Commission on June 9 granted the application of the Plattsburg Traction Company, extending the time to May 29, 1931, during which the company is authorized to charge 10 cents for the transportation of passengers within the city of Plattsburg, N. Y. On May 29, 1926, the Common Council of the city of Plattsburg authorized the company to charge a 10-cent fare for a period of five years. Application was made to the commission for approval of this fare and the commission granted such approval to remain in effect until June 4, 1927. The company then asked for a further extension in accordance with the action of the city officials. The commission was satisfied that such fare was just and reasonable.

Special Rates in Oregon.—The Oregon Electric Railway has been making special rates for the military tournaments and commencement festivities at the colleges and universities along its Willamette Valley line, in Oregon. Round-trip tickets were sold at the rate of about $3.70 for 100 miles, between Portland and way points.

Changes Awaited in Birmingham.—Railway rerouting and other traffic changes recommended by Ross W. Harris, following a traffic survey of Birmingham, Ala., will probably go into effect on June 26. J. S. Pevear, vice-president and general manager of the Birmingham Electric Company, said the company expects to have the track changes completed and to be ready to put the rerouting into effect on that day. Work of making the track changes will cost approximately $100,000. The Alabama Public Service Commission held that the City Commission had ample authority under the police powers of the city to require the rerouting as recommended in the survey. That body dismissed a petition of the company for right to make the changes on the ground that there was no question of service involved and that the commission was without jurisdiction.

Discourages Railway Resumption.—With the transportation problem in Columbia, S. C., rapidly becoming more aggravated, members of the Columbia City Council have asked R. L. Peterman, vice-president of the Broad River Power Company, which formerly operated cars in Columbia, about the possibility of resuming railway service. In reply to a question from the Mayor of Columbia, Mr. Peterman said he saw "no hope at all" for the resumption of service. He expressed the belief that railway service could not be made to pay and that street cars as a mode of public transportation were gradually being abandoned. Mr. Peterman, however, said he would take the matter up with higher officials of his company.

Opposes Fare Rise.—Declaring that the "time is inopportune" for the Georgia Public Service Commission to approve an increase in the Atlanta, Ga., fares, the Brookhaven Chamber of Commerce, the Morningside City League and the citizens of Oakland City—all suburbs served by the Atlanta system—have filed protests with the commission against the proposal of the Georgia Power Company to increase fares. July 12 has been set as the date for hearing. Several days ago the Georgia Power Company filed a petition with the Georgia Public Service Commission asking permission to increase present cash fares in Atlanta from 7 cents to 10 cents, as well as to increase price of tickets from three for 20 cents to three for 25 cents. It was alleged by the company that the railway division, instead of earning the 8 per cent on its investment authorized by the commission, was failing to reach this figure by approximately $1,000,000.

Recent Bus Developments

Interurban in Michigan Secures Operating Rights

Will Start Six Buses to Compete with Present Services to Michigan Shore Resorts

The Michigan Public Utilities Commission announced in an order issued on June 15 its decision authorizing the Grand Rapids, Grand Haven & Muskegon Railway to operate buses in conjunction with the company's electric cars between Grand Rapids and Muskegon and Grand Rapids and Grand Haven. For more than a year the officials of the company have sought to secure this right against the pooled interests of individual or syndicated bus lines that parallel the railway. President S. L. Vaughan, announces that buses will start the service on July 1.

The awarding of the franchise establishes a precedent in Michigan in that the territory involved now is served by another bus line. It was the last official act of the commission before two of its members retired to make way for two new members appointed to the body by Governor Green. Commissioners Odell, Duff and Doyle signed the order. Commissioner Pepper refused his signature. Commissioner Handy was absent from the board, having resigned on June 11.

The three commissioners said they acted after representatives of the bondholders testified the road would be abandoned unless bus service was permitted. Their order was an attempt to prevent the railway from going the way of the Grand Rapids, Holland & Chicago Company, recently defunct.

Officials of the interurban met on June 15, arranged a tentative schedule for the new buses and announced an hourly service both ways after 9 a.m. The electric cars will be operated morning, noon and night to accommodate persons who reside in nearby cities and work in Grand Rapids. Limited trains will continue to connect with the boats from Grand Haven and Muskegon to Milwaukee and Chicago. Freight car service will not be affected by the bus service.

To help popularize the bus service, hand baggage will be carried on the buses, while trunks, sample cases and other luggage too large for the buses will be transported in a combination freight and passenger car run on the interurban at noon.

The company will start its new service with six buses of the latest type, painted tangerine and trimmed in black to correspond with the interurban cars. They will be known as the Lake Line Motor Coaches.

Two sets of terminals will be established in Grand Rapids and Muskegon and in Fruitport and Grand Haven under this double interurban and bus plan, with the bus line junction at the present interurban station at Spring Lake. The line running from Fruitport and hugging the shore of Spring Lake to the village of Spring Lake and thence to Grand Haven will service many small resorts and open up a route hitherto without public transportation accommodations.

Mr. Vaughan says his company plans to charter buses to be run to any part of the state. After July 1 through buses will be run from Grand Rapids to Grand Haven to serve vacationists at the various resorts.

Mr. Vaughan hopes the new service will permit his company, now in receivership, to be brought back to a paying basis. Revenues taken from the railway by the competing bus lines are large during the summer tourist season.

I.C.C. Working on Bus Report

The Interstate Commerce Commission expects to complete its report on the operation of buses and motor trucks by, or in connection or competition with, common carriers subject to the interstate commerce act in time to submit it to Congress at the opening of the regular session. John J. Esch, chairman of the commission, so stated orally on June 11.

The investigation was ordered by the commission on its own motion on May 21, 1926. The scope of the investigation includes "the legality and propriety of the arrangements under which buses and trucks are operated; the rates, fares and charges for such services, and the provisions for filing schedules thereof, and the extent to which the traffic and revenue of carriers subject to the act are affected by the operation of motor buses and trucks."

Bus Feeders to Be Installed by Chicago Surface Lines

The Chicago Surface Lines is about to enter the bus field. In anticipation of the development of a number of coach lines in the near future, a separate motor coach organization has been established and all bus operation and maintenance will be under the direction of Walter Becker, assistant superintendent of the utility department. Temporary headquarters will be at the carhouse at Grand and Leavitt Streets, which has been remodeled for this purpose. The management has recognized for some years the value of motor coaches as feeders to the street car service, but opposition presented by the Chicago Motor Coach Company delayed the matter before the Illinois Commerce Commission for some time.

Five buses for this purpose are now being manufactured by the Twin Coach Corporation, Kent, Ohio, and delivery is expected in the latter part of June. Following that they will be put into service on Diversey Avenue from Crawford Avenue to Laramie Avenue, a distance of 1½ miles. This is the new Fageol type of bus referred to previously in the ELECTRIC RAILWAY JOUR-

NAL. It will seat 40 passengers and will be painted Para red and cream, the new standard colors of surface lines cars. The new coaches are for one-man operation. The operators will wear a type of uniform different from that of the street car men. The color is tan-gray, the coats of the Norfolk type with breaches and puttees.

Notices have been posted at all carhouses so that present employees may apply for this service and, if possible, the new group of operators will be selected from the present force of trainmen.

The rate of fare will be 7 cents with free transfers to connecting lines, the same as on the street cars.

Another Bus Line for San Diego Railway

Lloyd's El Cajon stage line, operating buses between San Diego and El Cajon, by way of La Mesa, has been sold to the San Diego Electric Railway, San Diego, Cal. The price paid was not made public. The sale involves the franchise and the equipment, consisting of two modern buses. The actual transfer of the franchise and property will be made as soon as authorization is secured from the State Railroad Commission.

It is understood the railway will operate the bus line as an auxiliary to its railway from the eastern terminus of the electric line through La Mesa to El Cajon. The railway has two applications before the Railroad Commission at the present time, requesting permission to operate lines on the routes affected. They are from 56th Street, on El Cajon Avenue, to La Mesa, and also from 34th Street, on Imperial Avenue, to La Mesa, by way of Encanto.

Abandonment in Indiana Sought

The Evansville & Ohio Valley Railway, Evansville, Ind., recently asked the Indiana Public Service Commission for permission to abandon its interurban line between Evansville and Mount Vernon. In the petition the company declares it will provide for a number of passenger and freight vehicles sufficient to accommodate a volume of business equal to that which it now has.

Improved roads were blamed by the company for its inability to operate between the towns at a profit. In its petition the company points out that the Indiana State Highway now extends from the city limits of Evansville to the city limits of Mount Vernon, running almost parallel with the railway line; that the highway is now in the course of construction and is being paved the entire distance between the two cities. It sets forth that when the highway is completed it will be unable to operate between the two cities except at a great loss.

The petition promises no increase in the present rates for either passengers or freight. The present fare schedule is based on 3 cents a mile, with a minimum fare of 10 cents. The Mount Vernon line has been operated since 1905. The Evansville & Ohio Valley assumed control in 1918.

New Agreement in Miami

The bus contract between the city of Miami and the Miami Beach Railway, Miami, Fla., has been canceled by agreement between the City Commission and company officials. A new agreement takes its place. Under it the city is relieved of the payment of about $1,000,000, including the cost of the buses and equipment, and is further relieved of reimbursing the railway for an operating deficit covering a guarantee by the city to meet the actual cost of operating the buses. The operating deficit, as shown by the company's books, is $369,499, although the city held an audit would show it to be less.

The new agreement extends to July 16, 1954. If it should be canceled by the city or the courts, the old contract is reinstated and the city is obligated to pay the sums due the company as of present date only.

In the new agreement the city waives the annual rental now being received by the company for the use of its railway. This amount averages less than $5,000 a year until 1929, when it was subject to revision for succeeding years. On the other hand, the city is relieved of purchasing new cars as was required in the railway agreement.

The agreement provides that if the city fails reasonably to regulate the transportation business as a whole in such manner as to permit the company properly to protect its revenues, investments and present operations, the agreement is canceled automatically. Both city and company officials declared that the new agreement would not affect the status or operation of other bus companies.

J. H. Gill, vice-president and general manager of the Florida Power & Light Company, indicated that public policy had a bearing on the company's decision to waive its claims. He said:

> The Florida Power & Light Company has investments in Florida totaling approximately $121,000,000, the safety of which, in the final analysis, is dependent upon the public and the public's attitude toward the company. With respect to this bus contract the company feels that it can better afford to waive $1,000,000 than to have the public assume that the company is being unduly benefited under any contract. The Florida Power & Light Company is and has been willing at all times to bring its problems before the court of public opinion in the belief that it will receive a fair answer from the people.

Meanwhile the final hearing of the jitney bus drivers' petition for an injunction to prevent the city from enforcing an ordinance that would keep them out of the business district of the city had been continued until June 10 to enable attorneys for the Miami Beach Railway, recently named codefendant in the action, to prepare their case.

Details of Regulation Discussed by Nebraska Commission

Thirty-five operators of intertown bus lines were represented in conference with the State Railway Commission on June 8 at Lincoln, Neb., to discuss future regulation and supervision of the business, to be taken over by the commission by virtue of a law that becomes effective on July 24. The conference developed that most of the companies wrote off their buses in four years, while one does it in three years.

The new law does not authorize the commission to fix rates or to issue certificates of convenience or necessity, but it does authorize the state body to supervise schedules and to prohibit any being used that are not approved.

The matter of insurance was warmly debated. The commission desires to increase the amount for the death or injury of one person from $5,000 to $7,000, with a total coverage of $30,000 for one accident. Another meeting will be held with insurance agents as advisers. They were not prepared to say that the new rules would decrease hazards sufficiently to influence rates downward. Another matter considered is a uniform system of accounts.

Violation of Operating Agreement Charged

The California Railroad Commission has directed the Western Motor Transport Company to cease immediately the transportation of passengers between North Vallejo and King, Napa, Flosda, Napa Junction, Sacramento Junction, Soscal and Napa Hospital in California following the filing of a complaint by the San Francisco, Napa & Calistoga Railway, which alleges that the bus company was carrying local passengers in violation of the terms of its operative rights granted by the commission. The defendant company was directed to cancel all rates applicable to such illegal service and through its successor in interest, the Dunham Stage Lines, to cease the transportation of passengers between Napa and King and between Napa and North Vallejo and to cancel its rates now on file for such service conducted jointly with the California Transit Company.

Buses Operating Over Former Railway Route.—Bus service was started by the Worcester Consolidated Street Railway, Worcester, Mass., on the recently abandoned railway route between Worcester and Webster, Mass., on June 1. It is planned to operate buses on express schedule to the Auburn and Oxford town lines. Transfers will be issued to passengers for use on all railway and bus lines of the company at connecting points.

Buses Succeed Cars.—An order was issued by the Illinois Commerce Commission granting the Tri-City Railway permission to remove its tracks and suspend service on the Stephens Park line, Moline, Ill. At the same time a certificate of convenience and necessity was granted to operate buses over the route from Fourth Avenue and Thirteenth Street to 37th Avenue and Seventh Street, Moline.

Pittsburgh Via the Gray Line.—A ten-page conveniently folded booklet has been issued by the Pittsburgh Motor Coach Company, subsidiary of the Pittsburgh Railways, Pittsburgh, Pa., intended to induce its patrons to see the steel and electrical city by means of the Gray Line, under which trade name the company operates. There are tours daily and on Sundays and holidays. They cover all points of interest in the city and suburbs.

Financial and Corporate

Costs of Connecticut Company Increase

An improvement over 1925 was the result of operations by the New York, New Haven & Hartford Company in 1926. This was the comment of E. J. Pearson, president, in the 55th statement of the affairs of the company addressed to the stockholders. The volume of freight traffic was the heaviest in the history of the company.

The net income of the Connecticut Company, one of the largest subsidiaries, shows a decrease in 1926 compared with 1925. Operating revenues increased principally from bus operation, while rail revenues decreased, due largely to the substitution of bus operation in December, 1925, for rail operation between Norwich and North Grosvenordale. Operating expenses increased principally on account of heavy cost of snow removal in February and December, 1926, and to increased rates of pay granted car and bus operators and shopmen, which was partially offset by increased economies. Taxes also increased, principally those paid the federal government.

On the lines of the New York. Westchester & Boston Railway 11,686,022 passengers were carried during the year, an increase of 1,531,823, or more than 15 per cent. An extension of the road from Larchmont to Mamaroneck, a distance of 1.79 miles, was opened for business on March 21, 1926. The number of passengers handled during the year at the two stations on the new extension was 526,051. A new station was constructed and opened for business on Nov. 7, 1926, on the White Plains Branch at Ridgeway. Extension of the road to Harrison, a distance of 1.70 road miles, is under construction and will be opened for business about June 1, 1927. There will be two stations on this extension.

The accompanying table shows the income account of the electric railway properties of the New York, New Haven & Hartford Railroad in 1926 compared with 1925.

An interesting reference is made in the report to the law enacted by the Legislature permitting the New Haven road to take over the securities of the New England Investment & Security Company, which owns the Springfield Street Railway and the Worcester Consolidated Street Railway. The New Haven company reiterates its faith in the electric railway industry. It states the company "is proceeding to rehabilitate the Worcester and Springfield properties in the hope that by placing them upon a profitable basis it may realize the whole or at least the greater part of the above investments." The company says that there seems to be no reason why, with up-to-date facilities, the railways in Worcester and Springfield might not materially increase their revenues and decrease their expenses.

U. G. I. After Day & Zimmermann

Utility Holding Company Arranges to Take Over Engineering and Management Organization—Engineers to Continue Active in Management of Utility Properties

The United Gas Improvement Company, Philadelphia, has obtained a controlling interest in Day & Zimmermann, Inc., Philadelphia, subject to the approval of the stockholders.

Arthur W. Thompson, president of the United Gas Improvement Company, says the business of the firm of Day & Zimmermann, Inc., will continue under the direction of Messrs. Day and Zimmermann. According to Mr. Thompson, the transaction is in line with the U.G.I. policy to extend its activities in co-ordinated public utility management, engineering and construction, as well as to acquire financial interest in such properties as may offer opportunities for consolidations and development of benefit to the public and investors. He said:

> The United Gas Improvement Company, with the rapid growth of its subsidiary companies and its extensive interest in associated properties, is fortunate in supplementing its holdings and personnel with an organization of such high standing as that of Day & Zimmermann, Inc., as the extent to which pressing needs for constructive public utility and industrial development and management can be undertaken is limited by the available supply of qualified executives and assistants to assume such responsibilities.
>
> There is much to be done in this field of endeavor which will react to the benefit of the public generally as well as customers and investors such as should result from effective supervision, co-ordination and the advantages of economic expansion plans.
>
> There will be no change in the method of conducting the business of the firm, which will continue under the direction of Messrs. Day and Zimmermann and their capable associates and organizations, as their leadership will undoubtedly produce results in the future as gratifying as have been their achievements in the past.

Day & Zimmermann, Inc., are engaged in the general business of engineering and construction, special investigations, appraisals and reports, and management of public utilities and industrial enterprises.

The work of their investigations and reports department has covered all branches of public utilities and a wide variety of industries in every state in the Union and in South America and Europe. In connection with this work an office is maintained in Paris. The clients served by this department include many of the foremost bankers of the country as well as the largest public utilities and industrial organization.

The engineering and construction division has had a diversified and valuable experience in the planning and

INCOME ACCOUNTS

	Connecticut Company		Berkshire Street Railway		New York, Westchester & Boston		New York & Stamford	
	Year 1926	Comparison With 1925 Increase or *Decrease*	Year 1926	Comparison With 1925 Increase or *Decrease*	Year 1926	Comparison With 1925 Increase or *Decrease*	Year 1926	Comparison With 1925 Increase or *Decrease*
Operating revenues:								
Passenger	$13,931,990	$137,147	$810,387	*$10,601*	$1,739,343	$230,662	$423,567	*$89,703*
Other	717,691	*9,641*	40,271	2,385	172,362	32,141	3,539	*1,139*
Total	14,649,682	127,505	850,659	*8,215*	1,911,705	262,804	427,107	*90,842*
Operating expenses:								
Maintenance of way and structures	1,977,900	120,119	144,554	2,014	129,211	*6,793*	67,074	11,080
Maintenance of equipment	2,000,281	92,092	129,505	20,816	252,571	115,467	134,807	87,293
Transportation	6,773,770	191,677	419,896	*4,023*	606,080	65,568	183,791	*26,103*
Other	1,165,564	*71,558*	57,466	*17,481*	259,434	12,617	71,231	*623*
Total	11,917,518	332,330	750,973	1,326	1,247,298	186,859	456,905	71,647
Net operating revenue	2,732,164	*204,825*	99,686	*9,541*	664,406	75,944	*29,798*	*162,489*
Tax accruals	790,832	160,504	34,631	14,486	237,442	21,154	22,739	*607*
Operating income	1,941,331	*365,329*	65,055	*24,028*	426,964	54,789	*52,537*	*161,882*
Non-operating income	71,653	20,895	1,654	*4,507*	9,477	2,506	2,278	1,423
Gross income	2,012,985	*344,434*	66,709	*28,535*	436,442	57,296	*50,258*	*160,458*
Deductions from gross income	1,477,521	*14,424*	*302,581	*129*	*2,194,689	142,742	*114,993	1,426
Net income	$535,464	*$330,009*	†*$235,871*	*$28,406*	†*$1,758,247*	*$85,446*	†*$165,252*	*$161,884*

Italics denote decreases. † Deficit.

* Berkshire Street Railway—deductions from gross income include $210,066 interest accruing to N. Y., N. H. & H. R.R., but not included in income account.

New York, Westchester & Boston—deductions from gross income include $1,157,841 interest accruing to N. Y., N. H. & H. R.R., but not included in income account.

New York & Stamford—deductions from gross income include $40,763 interest accruing to N. Y., N. H. & H. R.R., but not included in income account.

construction of industrial plants, public utility properties, piers, bridges, and recently has been active in the construction of hotels, hospitals, etc.

The prospective purchaser explains that the public utility management bureau has been doing an unusually constructive service for many years in the upbuilding of properties along sound lines, looking toward the rendering of the best service to the public and the holders of the various securities. From the commencement of these operations, fifteen or more years ago, every effort has been made to place the administration and operation of the properties on the highest possible plane comparable with the best that has been accomplished in the industrial field, in this way assuring not only the most efficient operation and safety of investment but the fullest measure of co-operation with regulatory bodies.

Among the properties at present under the management of Day & Zimmermann are:

> The National Public Service Company, a holding company, which through its subsidiaries in New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, Georgia and Florida, furnishes electric light and power, gas, steam and electric railway, bus, ice and water service to 874 communities with a population of 2,139,000 and consolidated gross earnings of $27,788,000.
>
> The General Public Utilities Company, which furnishes directly or through its subsidiaries electric light, ice and water to sixty towns in the States of Florida, Louisiana, Texas, New Mexico, Arizona and South Dakota, with an aggregate population of about 200,000 and gross earnings of $4,055,000.
>
> The Southern Ohio Public Service Company, which is an operating company serving the city of Zanesville, Ohio, with electric light and power and street railway and a bus or interurban system, with a population of about 30,000 and gross earnings of $1,546,800.

One of the first properties organized by Day & Zimmermann, Inc., was the Penn Central Light & Power Company, which was recently acquired by the Insull interests.

Following the original announcement about the deal, it was made plain that the controlling interest in Day & Zimmermann, Inc., will be obtained by the United Gas Improvement Company through an exchange of securities. Stockholders of that company will be called upon to meet in the autumn to pass upon the plan to issue the amount of U.G.I. stock necessary to fulfill the terms of the transaction. Mr. Thompson said:

> We wish to emphasize the fact that Day & Zimmermann, Inc., will continue to be very active in the management and operation of the various properties which have been so successful under their direction. This transaction, involving properties in fourteen states, has been under way for several months. When all the details of financing are worked out the stockholders and customers of the various Day & Zimmermann properties will find that their business will continue to be operated on the same high standard under the leadership of Charles Day and John E. Zimmermann, aided by the same men whose skill and vision have placed the management in the forefront of the public utility industry.

Bonds of Omaha Company to Be Extended

Plans are being advanced for the extension of the $9,155,000 of first consolidated mortgage 5 per cent bonds of the Omaha & Council Bluffs Street Railway, Omaha, Neb., from Jan. 1, 1928, then maturity date, to Jan. 1, 1931, at an advance in interest to 6 per cent. The trustee of the issue is the Guaranty Trust Company, New York. The bonds are secured by an absolute first mortgage on the 130.5 miles of track in Omaha. It is expected that in the interval between July 1, 1927, and Jan. 1, 1931, the question of the relations between the company and the city with respect to its franchise rights will have been satisfactorily adjusted.

Traffic and Revenue Results in Akron

Gross earnings of the transportation department of the Northern Ohio Power & Light Company, Akron, Ohio, for the year ended Dec. 31, 1926, were $454,255 less than in 1925. This loss of revenue is accounted for by further increases in the number of privately owned automobiles and because of partial suspension of railway service in Akron and on the interurban railway divisions in May last year. This suspension of service was caused by a strike or "walkout" on the part of some of the employees in the transportation department. The strike lasted from May 1 to May 22, when most of the men returned to work. This explanation was included in the annual report of the company to the stockholders.

The total number of revenue passengers carried was 63,372,334, compared with 65,619,603 in 1925. Of the total number of revenue passengers during the year 48,973,671, or 77 per cent, were carried on the city railway and bus lines and 14,398,663, or 23 per cent, were carried on the interurban and bus lines. Segregated figures show that the city divisions carried 2,379,178 fewer passengers in 1926 than in 1925 and that the interurban divisions carried 131,909 more passengers than in the preceding year.

Comparative figures of revenue passengers carried on rail and bus lines follow:

	City Systems	Interurban Systems
1922	50,632,248	17,117,064
1923	54,112,423	16,784,535
1924	48,563,053	14,478,984
1925	51,352,849	14,266,754
1926	48,973,671	14,398,663

A total of 140,696 tons of freight was handled during 1926 and the gross revenue therefrom was $614,762, compared with 160,823 tons handled in 1925 and gross revenue of $647,711.

In the transportation department the company continued its efforts in improving its service to meet the demands of the public. During the year it added quite largely to its motor bus equipment, and for the purpose of improving the special express bus service operating in Akron at a 10-cent fare it purchased two double-deck buses specially designed for one-man operation. To facilitate operation both of these buses are provided with front entrance, and one of them has the stairway from main to upper deck in the front part of the bus instead of the rear.

Among additions and improvements are included the following:

Purchase of 35 single-deck and two double-deck buses for operation in city and interurban service.

INCOME ACCOUNT OF THE NORTHERN OHIO POWER & LIGHT COMPANY FOR THE YEAR ENDED DEC. 31

Gross Earnings:	1926	1925
Electric	$6,317,554	$5,322,156
Transportation	5,723,286	6,177,541
Total	$12,040,840	$11,499,698
Operating expenses and taxes:		
Operating expenses	8,181,133	7,618,402
Taxes	802,200	822,000
Total	$8,983,333	$8,440,402
Gross income	3,057,507	3,059,296
Interest—net	1,527,628	1,428,680
Amortization of debt discount and expense	132,670	129,161
Total	$1,660,299	$1,557,841
Net income available for dividends and retirement reserve	$1,397,208	$1,501,454
Dividends on preferred stock	473,824	437,334
Balance	$923,383	$1,064,119
Ratio of operating expenses to gross earnings, per cent	67.94	66.25
Ratio of operating expenses and taxes to gross earnings, per cent	74.61	73.40

Rebuilding and equipping 46 city-type electric cars for one-man operation.

Purchase of 25 new freight trail cars and the reconstruction work necessary to convert two interurban passenger cars into freight motor cars.

Completion of modern freight houses in Akron and Bedford.

Renewal and reconstruction of track, both interurban and city, at various places on the system.

On the question of safety and accident prevention the report states that the situation is gratifying because of the good results obtained in the face of increases over 1925 in the number of car and bus miles operated and in the registration of private automobiles. Despite the great increase in automobile registrations from year to year and the resultant congestion of traffic, there were fewer accidents on the property in 1926 than in 1920.

B. C. Cobb, president, refers to the expiration of franchises for electric railway operation in the city of Canton on Feb. 23, 1928, and in the city of Akron on Nov. 12, 1928. In negotiating with the city authorities with respect to renewal rights, the management, he says, will make every effort to conclude fair and reasonable arrangements from the standpoint not only of return on the value of property used in rendering transportation service to the public but also from the standpoint of the people served.

Easement Case Closed in Baltimore

A valuation for easements of the United Railways & Electric Company, Baltimore, Md., probably will be fixed by the Public Service Commission within a month. Harold E. West, chairman, so announced on June 13 at the conclusion of hearings in the matter before the commission. A valuation of $7,000,000 was set originally by the commission, but a court order, following an appeal, required a rehearing of the case.

Edwin G. Baetjer, associate counsel for the United, at the hearing on June 13 charged that the valuation figure of $2,773,000 submitted by Thomas J. Tingley, people's counsel, was full of errors. Mr. Tingley in his final argument cited the opinion of the Court of Appeals in ordering the case to be reheard before the commission and interpreted it to mean that the court expected a lower valuation than $7,000,000 for the easements. Mr. Tingley said that the Court of Appeals recognized the fact that the value ascertained for rate purposes should be a relatively small one.

Counsel for the United contend that approximately $11,000,000 is the proper valuation for the easements.

Bus Lines in Washington Sold

The Washington Rapid Transit Company, owning bus lines in Washington, D. C., has been sold by the North American Company to Harley P. Wilson, who recently became a director in the latter company. The line is pressing an application before the Public Utilities Commission for a 10-cent fare. The North American Company is interested financially in the Washington Railway & Electric Company.

Revenue in Fort Wayne Higher

Operating revenue of the Indiana Service Corporation, Fort Wayne, Ind., in 1926 was $4,345,946, according to the annual report of the company made public on March 2. The figure shows a gain of $490,057, or approximately 13 per cent over operating revenue for the preceding year. Net income of the company in 1926, after payment of all charges, including interest on funded debt, totaled $420,963, as against $348,383 in 1925. Local and interurban transportation service was furnished to 25,667,845 passengers in 1926, compared with 25,648,155 in 1925.

Expenditures aggregating $2,012,000 were made during 1926 for various improvements and additions to the electric utility and railway systems, including the purchase of new equipment, construction of a new freight terminal, car shops and stores building at Fort Wayne.

The company acquired during the year the electric light and power and electric railway properties of four interconnected utility companies in the vicinity of Fort Wayne.

Robert M. Feustel, president, told the stockholders that a new issue of $890,000 par value 6 per cent preferred stock was offered to investors during the year. This issue is on a parity in every respect with the 7 per cent preferred stock issued in 1925, except as to annual dividend rate and callable price. The proceeds of the sale of this stock are being used to finance current corporate requirements.

Equipment trust certificates of series E in the principal amount of $160,000 and bearing interest at the rate of 6 per cent per annum were issued in 1926 to finance the acquisition of the five new passenger coaches and two parlor-buffet cars mentioned above.

As a result of the offering for sale of the new 6 per cent preferred stock, increasing numbers of customers, employees and other residents of the territory served became part owners of the company during 1926. A total of 4,238 stockholders was recorded on the company's books on Dec. 31, 1926. This represents a gain of approximately 256 per cent over the number recorded at the close of 1925.

Revenues in Albany Show Decrease

In the 97th annual report of the Delaware & Hudson Company for the year ended Dec. 31, 1926, statistics and operating results of the United Traction Company, Albany, N. Y., are included.

Operating revenues of the United Traction Company from all sources during 1926 amounted to $2,933,522, a decrease of $157,097; operating expenses were $2,370,907, a decrease of $58,768, and taxes were $213,100, an increase of $9,550. Operating income was $349,515, compared with $457,394 in 1925. Among the items of decreased operating expenses were: Injuries and damages, $12,828; paving, $2,947; transportation expenses, $59,800; power purchased, $2,205; maintenance of equipment, $20,215, and general and miscellaneous expenses, $2,639. These decreases were partly offset by increases in maintenance of structures, $129; maintenance of power and line, $8,747; track and roadway labor, $2,217; track and roadway material, $1,728; cost of removing snow and ice, $20,539, and equipment retirements, $8,579.

The company's proportion of the cost of new pavement laid in 1926 was $82,148, of which $29,603 was chargeable to operating expenses and the balance to cost of property used in public service. Reconstruction of tracks, made necessary by the continuation of street paving programs, cost the company $40,357, requiring charges to operating expenses of $37,507.

A petition for increased fare is now pending before the Public Service Commission and hearings have been concluded. The proceeding was delayed by an appeal to the courts, made necessary by the claim on behalf of certain municipalities that franchise restrictions deprived the Public Service Commission of authority to award reasonable rates. The Appellate Division, Third Department, denied these claims.

Operating revenues of the Hudson Valley Railway during 1926 amounted to $773,399, operating expenses to $787,308 and taxes to $50,850. There was an operating deficit for the year of $64,759, comparable with a deficit of $40,240 in 1925. Operating revenues decreased $60,526, operating expenses decreased $31,157, and taxes decreased $4,850.

The abandonments authorized by the Public Service Commission during the year 1925 have been physically completed. Application has been made to the Public Service Commission for permission to abandon the branch line between Thomson, N. Y., and Greenwich, N. Y., and the branch extending from Lake George, N. Y., to Warrensburg, N. Y.

Operating revenues of the Capitol District Transportation Company, Inc., bus subsidiary of the United Traction Company, amounted to $303,651 during 1926; operating expenses to $353,350 and taxes to $2,592. There was an operating deficit for the year of $52,291. On Nov. 6, 1926, operation of buses was started over what was formerly the Albia Line of the United Traction Company. A franchise to operate buses on the Third Street, Rensselaer Line of the United Traction Company was obtained during the year, and it is proposed to start bus service on that line during the early part of 1927.

Bonds of Berkshire Company Extended

The Department of Public Utilities of Massachusetts has approved the purchase by the New York, New Haven & Hartford Railroad of first mortgage bonds of the Berkshire Street Railway, Pittsfield, Mass., to the extent of not to exceed 50 per cent of the outstanding $770,000 of bonds so as to protect the railroad's stock interest in the railway. The New Haven company owns all of the capital stock of the Berkshire company. The bonds were extended in maturity date from June 1, 1922, to June 1, 1927, and have been further extended to June 1, 1937, at 6 per cent interest. The rate at present is 7 per cent. The New Haven Railroad is to pay not more than par for any of the bonds that it takes.

C. Q. Richmond, vice-president of the Berkshire Street Railway, has explained to the bondholders that the situation which has confronted the company, in common with most other electric railways, resulting from the increase in the use of the private automobile, made it difficult, if not impossible, for the company to provide the funds to pay off the bonds on June 1, or to arrange at this time to refund them upon satisfactory terms. Consequently, it became necessary for the directors to ask the bondholders to cooperate in a further postponement of the maturity date for the payment of the principal of the bonds.

The extension agreement provides that holders of the bonds may become parties thereto by deposit of their bonds with Harris, Forbes & Company, Inc. Bonds so deposited will be stamped with a reference to the agreement and additional coupons will be annexed to the deposited bonds providing for the payment of interest at the rate of 6 per cent on such bonds to and including June 1, 1937.

Mr. Richmond expressed the hope that all bondholders would defer the demand for payment of the principal of their bonds, but he explained that the principal stockholder of the railway, the New York, New Haven & Hartford Railroad, had agreed to purchase the bonds at par from holders who felt under compulsion to sell.

Road in Homestead to Be Abandoned.—Officials of the Homestead & Mifflin Street Railway, Homestead, Pa., organized in 1902 and operating a 3.7-mile line from Homestead to Lincoln Place, say they will abandon the line on Aug. 1. Stockholders claim they lost $20,000 on the Homestead lines in the last 25 years. Contemplated street improvements over the company's route would entail a $300,000 expenditure, which the stockholders do not feel able to meet. A bus line will supplant the railway system.

Personal Items

Up From the Ranks

H. M. Littig Advanced from Conductor to General Manager of Utility at Davenport

"What chance has a street car conductor today? He can never become anything else. The minute he takes such a job he admits to the world his business ability is nix, that he could not hold down a bigger and better job."

This remark was made by a young conductor in a midwestern city to a passenger who had asked him in a friendly way how he was getting on.

That same day in the same city the newspapers carried the announcement of the appointment of Harry E. Littig to be general manager of the Peoples Light Company, a $6,000,000 corporation. It was a promotion, the newspaper stories stated, for the new general manager had long held a responsible position with his company. Comment was made on his prominence in civic affairs and his other business connections, but none of these facts comprised the feature of the story.

H. M. Littig

What seemed to stand out as significant was that the new general manager had risen from the ranks of labor to the chair of business administration. He had worked his way up from the bottom. Mr. Littig is only in his forties and his future in the field of business is still an open road.

Leaving an Iowa farm, Harry Littig, a lad of 20, worked his way through a six months course in a business college in which unusual ability for figures was indicated. This course finished he applied for a job as street car conductor. Although he was under the required age of 21 the railway manager hired him. He liked the boy's looks. For a year and a half the young man ran a street car. His reports were so neat and his cash balanced so well with his trip sheets that on heavy days and during rush hours the manager put him on congested lines to collect fares.

One Sunday morning his chance came, his first chance. The cashier was sick. He heard about it on his early morning run and applied to the general manager for the job.

"Do you think you can do it?" the manager asked doubtfully.

"I'd like to try," the young man answered.

Pointing to the safe where the receipts of the runs during the last twelve hours were deposited, the manager handed the applicant the combination of the safe and said: "Go to it." A half hour later Mr. Littig said: "I have finished this. What shall I do next?"

Much in doubt as to its accuracy, owing to the record time in which the cash balance had been arrived at, the general manager checked the work done.

"It's the first time we've had an exact balance in six months," he commented. "We'll try you out."

Becoming cashier, Mr. Littig soon fell under the bookkeeper's eye. "Ever do any bookkeeping?" that worthy asked.

"A little," was the reply.

"Then you might as well help me out," the bookkeeper replied. And soon the cashier was doing most of the bookkeeping as well. Several months later the management made the young cashier the bookkeeper. Always knowing how to work and always willing to work, Mr. Littig became, as the years went along, chief clerk, then assistant treasurer, then assistant secretary and then secretary. While he was growing his company was also growing. From a railway undertaking it had grown to a railway and light enterprise. Today it is a subsidiary of a $190,000,000 corporation, the United Light & Power Company.

In these years Mr. Littig's home town, Davenport, Iowa, has also been growing, and with it he has grown, serving in every public money raising campaign in recent years, as president of the local Kiwanis club, as director in a score of volunteer movements where the only recompense was a sense of satisfaction in fulfilling one's civic duty. He is to-day essentially the same Mr. Littig who 31 years ago worked twelve hours a day, wore a uniform, had a number, ate cold lunch out of a lunch box and swept out his car with a broom.

O. D. Young Honored

The degree of Doctor of Commercial Science was conferred on Owen D. Young, chairman of the board of the General Electric Company, at the 95th annual commencement program at New York University held on June 8. Chancellor Elmer Ellsworth Brown, in conferring this honor, said that in American experience the practicing lawyer has passed by a more direct route to a position of leadership in a capital industry. Happy was the man who, having acquired so varied an experience and influence, found occasion to use his ripened powers for the public good; twice happy when he found occasion to use them for the wider good of the family of nations.

New Superintendent at Porto Rico —S. Howard Reid

S. Howard Reid has accepted a position with the Porto Rico Railway, Light & Power Company, San Juan, P. R., as superintendent of its electric railway division. This assignment became effective on June 13. For a number of years Mr. Reid has been superintendent of construction of export cars at the Philadelphia plant of the J. G. Brill Company.

The new incumbent at Porto Rico has been identified with the car building industry for more than 24 years. After leaving school he started his career with the Harlan & Hollingsworth plant at Wilmington, Del., from which he went to the American Car & Foundry plant, located in the same city. In 1902 he joined the forces of the J. G. Brill Company. Back in 1907 and up to 1909 he constructed and placed in service some of the first American equipment sent to Porto Rico, and in later years supervised the construction of a number of cars for Honolulu and Finland, which he also placed in service. Later he served as superintendent of equipment of the Honolulu Rapid Transit Company, which post he held until 1926, when he resigned to return to the Brill company.

S. H. Reid

Messrs. Luellen and Wells Promoted in Anderson

Ross E. Luellen, division passenger and freight agent of the Union Traction Company of Indiana, Anderson, Ind., was appointed assistant general passenger and freight agent with headquarters in Anderson effective on June 10. Mr. Luellen has been with the company since June, 1903, when he entered the service as clerk. Later he was made assistant claim adjuster and then promoted to safety engineer. From that position he was advanced to division passenger and freight agent.

Effective the same day, Ray J. Wells has been appointed chief clerk in the traffic department and will have charge of the advertising department. Mr. Wells was formerly secretary to the general manager. For seven years he was secretary to the general storekeeper of the C. C. C. & St. L. Railroad (the Big Four). He saw service in France in the railway engineering corps during the World War.

Changes in Brooklyn Personnel Announced

Three new division superintendents in the surface transportation department of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., were appointed recently to fill vacancies caused by recent transfers and deaths in the organization. The new appointees are John H. Dirlam, at Flatbush depot; Joseph E. McClenahan at Bergen Street depot, and William J. Roome, at 58th Street depot. Mr. Dirlam succeeds the late John Mooney and Mr. Roome takes the place of the late Morton S. Cornell. Mr. McClenahan succeeds Herman Bongard, who is now on the staff of the Accident Prevention Bureau.

In addition August J. Eck was appointed assistant division superintendent. He is assigned to the Ninth Avenue depot to assist Charles B. Attlesey, division superintendent in charge of that depot. All these positions were filled by men who have worked their way up from the ranks. Three of the men started their careers in Brooklyn as conductors and the fourth as a transfer agent.

Guy Eastman Tripp Dead

Chairman of Westinghouse Company Was an Officer of More than 25 Corporations—Man of Many Talents, Widely Known for His Managerial Skill and Financial Ability

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Guy E. Tripp

GUY EASTMAN TRIPP, chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, a director and officer in more than a score of other corporations and a prominent figure in the public utility field for many years, died on June 14 at the New York Hospital, at the age of 62 years. He had been ill since February. On several occasions Mr. Tripp had so far recovered that he had been able to leave the hospital for a drive, and his restoration to health was at one time anticipated. Last month, however, a new, though minor, operation became necessary, and although he rallied from this and had even reserved accommodations at Atlantic City for the convention of the National Electric Light Association last week, a relapse set in.

Mr. Tripp possessed the organizing and executive type of mind developed to the full with no handicap of timidity. He was a business leader, a financier and a harmonizer. In his earlier days he displayed the ability to master detail, but as he was called upon to command he quickly developed the capacity to delegate details to others. He could get at the heart of a problem, shape a policy and leave others to work it out. He was not an engineer, but he could point the way to engineers. He always kept at heart the interests of the people at large, and while an advocate of private ownership of utilities under state regulation, he was, whether right or wrong, broadminded enough to declare that there might be conditions under which public ownership would be effective. His was an enlightened sense of business responsibility.

The foundation was there upon which to build, but Mr. Tripp spent a long term of apprenticeship in which he was engrossed in mastering the essentials of financial and management problems. In consequence, the ability displayed by him in later life to follow the intricacies of financial, engineering and operating problems came as a source of wonderment to those who were unacquainted with the breadth of the man's experience and were not in a position to know the extent to which he had gone to ground himself with an intimate knowledge of the basic facts. Mr. Tripp knew. And others knew that he knew, although they did not always understand how it was that he knew. So he was called to one stupendous job after another.

In all the history of American business operations there were no reorganizations that called for the exercise of greater financial and management skill than the rehabilitation of the Westinghouse company and the Metropolitan Street Railway. His accomplishments in these two instances alone would inscribe the name of the man high on the roll of honor of the immortals of organized business, but outstanding as were the achievements of Mr. Tripp in both of these instances they represented only a small part of the man's vast work.

Quite naturally men in railway circles, acquainted with Mr. Tripp's record for efficiency and appreciative of his wide knowledge of railway matters, felt relieved at his choice in 1910 as chairman of the joint committee on reorganization of the Metropolitan Street Railway, New York City, which had just passed into the hands of a receiver. The Metropolitan had many subsidiaries; the receivership, had of course, caused much concern among stockholders; possessors respectively of senior and junior securities were engaged in internecine warfare, and disaster loomed. For two years Mr. Tripp worked at his new task, evolving by degrees a solution that proved acceptable to the conflicting interests.

Then in January, 1912, he was unanimously invited by the directors of the Westinghouse Electric & Manufacturing Company to become chairman of their board. He went to the company while it, too, was emerging from a receivership, forced on it during the troublous times of 1907. It had been piloted through the crisis by Robert Mather, whose death left the vacancy that Mr. Tripp was called to fill. His duties concerned in the main the financial and foreign interests of the company, and he carried out, with clear insight and a firm hand, the reorganization of its capital structure and did much to place the company on the sound basis it now occupies, with annual gross earnings of $185,543,000 as of March 31, 1927, and a net manufacturing profit of $15,779,000. On assuming the chairmanship of the Westinghouse board Mr. Tripp resigned from the Stone & Webster organization.

When the United States entered the war Mr. Tripp was appointed by the Department of War chief of the production division of the Ordnance Department, instrusted with the task of supervising and stimulating the production of all ordnance supplies. He was breveted an officer and soon rose to the rank of brigadier-general, the title of "General," by the tacit insistence of his friends and associates, sticking to him for the rest of his life. When the World War broke out the Westinghouse company obtained large contracts from the British and Russian governments for the manufacture of munitions, and Mr. Tripp was thus able to bring not only his great ability but the highest type of experience to his new duties. He cut through red tape and decentralized bureaus with a vigor of action and clearness of perception such, it was declared, as official Washington had seldom seen, dividing the country into districts, each in charge of a district chief, and supervising the expenditure of $16,000,000,000. For his patriotic services General Tripp received from Congress a distinguished service medal.

Leave of absence was granted the General by the Westinghouse board during his war-time service. When the conflict was over he resumed his duties with the company. In 1923 these took him to Japan in connection with reconstruction work after the disastrous earthquake. He completed arrangements in that country for the organization of a manufacturing company at Nogoya with $7,500,000 capital. The

Japanese government conferred upon him the highest decoration that it could award to a civilian foreigner.

Likewise in the radio industry, Mr. Tripp, following his pioneering instinct, devoted his energies to the new art, and to him was due in large measure the position of leadership in radio manufacture and broadcasting that Westinghouse assumed and maintained. Another favorite interest of Mr. Tripp's was "superpower." He was among the first to grasp the part that interconnection would come to play in the world of light and power, and he did much to bring its significance home to the public.

ENTERED BUSINESS IN 1883

Mr. Tripp's business career began in earnest in 1883, when the Eastern Railroad—now part of the Boston & Maine—employed him as a clerk at Salem, Mass. After seven years with the railroad he changed his post for one with the United Electric Securities Company. With this company, the Thomson-Houston Electric Company and the Industrial Improvement Company, a branch of the then newly organized General Electric Company, which had absorbed the Thomson-Houston firm, he spent another seven years, working as accountant and auditor. Then, in 1897, at the age of 32, he began a connection with Stone & Webster, already engaged in the development of public utilities, that opened before him the path of substantial success. He was soon appointed a traveling auditor for this company, then was made a manager of utility properties in the West and South, and finally a vice-president of the parent engineering and management organizations. In addition he came to fill high executive offices in subsidiary companies in the States of Texas, Washington, Kentucky, Minnesota and Massachusetts.

Mr. Tripp was born in the village of Wells, in the southeast corner of Maine, on April 22, 1865. His academic instruction was obtained in a two-year course at the South Berwick Academy, near his birthplace. He went into a country store at Wells, and this, he often said, was his training school for judging values quickly, which stood him in good stead later in his life. That later life was crowded with such interests as engineering, electrical development, railroads, economics, politics, learning, sports and social intercourse.

A SPEAKER OF NOTE

The wonder was that the man found the time and had the energy to carry on all the multifarious activities in which he indulged. Among his notable addresses was the one made to members and representatives of the American Electric Railway Association on Feb. 20, 1925, at the annual dinner in connection with the association's midwinter convention. He discussed the place of the bus in transportation, mass transportation versus de luxe service, and urged single control of transportation facilities.

As indicated previously, Mr. Tripp manifested an especially keen interest in the future of electrical development in America. His war-time experience convinced him that power was an essential factor in our prosperity and he made an exhaustive study of the American power situation in order to determine the best and most efficient methods of power generation, transmission and distribution. His articles and addresses on power development attracted wide attention, and a compilation of the more important of these, published under the title of "Superpower as an Aid to Progress," is regarded as an authoritative contribution to this subject.

Tributes and Appreciations

From General Tripp's large circle of friends and associates many expressions of sorrow, admiration and personal regard were elicited when news of his death became public. A few of these are printed below:

From LUCIUS S. STORRS, *managing director American Electric Railway Association:*

"An incalculable loss has been suffered by the electrical industry, and particularly by the transportation industry, through the death of General Guy E. Tripp. It is a loss which all of us feel most deeply: a great personal loss as well as the loss of a progressive and courageous leader and wise counsellor. The electric railway industry will be forever indebted to him for the great works he wrought for it. His genius for organization, his broad vision, his farsightedness, his high patriotism, his courage and his intensely earnest friendships empowered him to great achievements for the industry to which he devoted his life and for the nation that he loved and served. Those of us who knew him intimately will miss him grievously, but his good works are builded upon an enduring foundation."

From GERHARD M. DAHL, *chairman of the board Brooklyn-Manhattan Transit Corporation, New York City:*

"General Tripp was a man of great ability, great heart and great soul. He was successful not only in all that he undertook but he tied his friends to him with hoops of steel. His death means a loss not only to the community but also to a host of loyal and admiring friends."

From MATTHEW C. BRUSH, *president American International Corporation:*

"The electrical industry has lost one of its great pioneers, leaders and executives. I know of no other man who had more friends, and in my entire acquaintance with him over a period of twenty-five years I have never heard other than the most kindly commendatory expressions about him by every one who knew him. He was a man to whom all his friends could go for advice, counsel and guidance. His memory will live long in our hearts."

From PAUL D. CRAVATH, *general counsel Westinghouse Electric & Manufacturing Company:*

"General Tripp will be greatly missed in the wide field of business and public activities. He was much more than the chief executive of a great corporation—he was a real leader in the industrial world. Important as is his loss to the business community, his associates in the enterprises in which he was active, and more especially the Westinghouse Electric & Manufacturing Company, will miss him most keenly as a loyal friend and a considerate and inspiring associate. There are few men in the business world who will be so sincerely mourned by so wide a circle of friends."

From H. HOBART PORTER, *president American Water Works & Electric Company:*

"We have suffered a great loss in the death of General Tripp. His influence for good was very strong in all his activities, both in commercial business and in war work. Few came into contact with him without being benefited other than by the geniality and magnetism which he always radiated. These qualities, in addition to his unusual ability, breadth of view and rugged honesty of purpose, endeared him to all with whom he came in contact."

From JAMES H. MCGRAW, *president McGraw-Hill Publishing Company, Inc.:*

"Apart from the important office that he filled, General Tripp's versatility and personal force made him one of the dominant figures in the electrical industry. His influence reached beyond the manufacturing sphere and embraced all electrical enterprise. As chief executive of the great Westinghouse interests his work was of tremendous importance to electrical men everywhere. In the light and power field the steady growth of interconnection owed much to him, and so did the spread of interest in good public relations. He was a steadfast friend of the technical press, to which he contributed much encouraging retrospect and prophecy through interviews and original articles. But among those who had the privilege of calling General Tripp their friend all such considerations are swallowed up in sorrow for the loss of an associate with so many sterling qualities. There was a nobility about him that endeared him to all. His genuineness and his faith in the electrical industry, in his co-workers and in his own ideas were a great resource to many men. His splendid qualities of leadership will be long remembered."

From OWEN D. YOUNG, *chairman of the board General Electric Company (radio message from S.S. "George Washington"):*

"The death of General Tripp takes from the electrical manufacturing industry one of its ablest and most charming men. He had all the qualities of a great leader, the capacity to foresee, the courage to act and the ability to execute. I have known him intimately for more than ten years with constantly increasing admiration and affection."

Others who expressed briefly, by wire, their sense of what the electrical industry, the business world and they themselves personally had lost through the death of General Tripp were Samuel Insull, president Commonwealth Edison Company, Chicago; E. S. Webster, president Stone & Webster; Thomas N. McCarter, president Public Service Corporation of New Jersey, and E. H. Gary, chairman United States Steel Corporation.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Pools and Cartels Summarized at Geneva

By Edward J. Mehren
Vice-President McGraw-Hill Publishing Company, Inc.

This is a continuation of Mr. Mehren's article on the final session of the International Economic Conference which appeared in last week's Journal, page 1068. — Editor's Note.

POOLS and cartels formed one of the dominant subjects of the conference and resulted in quite a divergence of views. The conclusion was that they must be considered as good or bad, according to the spirit of their constitution and operation and the attitude of their managers toward the general interest. The field for such agreements, both national and international, is usually limited, so the conference declared, to branches of production already centralized and to products supplied in bulk or recognized grades.

Where applicable they can secure a more methodical organization of production, a reduction in cost by better utilization of equipment, the development on more suitable lines of new plant, a more rational grouping of undertakings, can check economic competition and reduce the evils resulting from fluctuations in industrial activity. By this means they may assure to the workers greater stability of employment, and at the same time by the reduction of costs and selling prices bring advantages to the consumer.

Nevertheless, the resolutions declared, if such agreements encourage monopoly and the use of unsound business methods, they may check technical progress and endanger the legitimate interests of sections of society and particular countries. Consequently such combinations should not lead to an artificial rise in prices, which would injure consumers, and should give due consideration to the interests of the workers. They should not restrict the supply of raw materials or basic products to any particular country nor create unequal conditions between the finishing industries of the consuming and producing countries. Nor must they prevent the development in any country of industries which that nation considers indispensable.

On the question of control of pools, the conference believed that international control of international pools cannot be set up. It recommends, however, that the League of Nations study these international pools, their effects on technical progress, on production, conditions of labor, supply and prices. This information, collected with the aid of the various governments, should be published. Such publicity is an effective means, on the one hand, of securing the support of public opinion for agreements which conduce to the general interest, and, on the other hand, of preventing the growth of abuses.

In this series of articles the term rationalization has been taken to mean all mechanisms for reducing cost of production and, therefore, the consolidation of industries has been included; this broad definition is in accordance with the German acceptance of the term. However, the conference limited it to scientific organization of labor, standardization both of material and of products, simplification of processes and improvements in the system of transport and marketing.

While obvious to us in America, the conclusions are so important for Europe that they are given here in full:

The conference considers that one of the principal means of increasing output, improving conditions of labor and reducing costs of production is to be found in the rational organization of production and distribution.

The conference considers that such rationalization aims simultaneously:

1. At securing the maximum efficiency of labor with the minimum of effort.

2. At facilitating, by a reduction in the variety of patterns (where such variety offers no obvious advantage), the design, manufacture, use and replacement of standardized parts.

3. At avoiding waste of raw materials and power.

4. At simplifying the distribution of goods.

5. At avoiding in distribution unnecessary transport, burdensome financial charges and the useless interposition of middlemen.

Its judicious and constant application is calculated to secure:

1. To the community greater stability and a higher standard in the conditions of life.

2. To the consumer lower prices and goods more carefully adapted to general requirements.

3. To the various classes of producers higher and steadier remuneration equitably distributed among them.

It must be applied with the care which is necessary in order, while at the same time continuing the process of rationalization, not to injure the legitimate interests of the workers, and suitable measures should be provided for cases where during the first stage of its realization it may result in loss of employment or more arduous work. It requires, further, so far as regards the organization of labor in the strict sense of the term, the co-operation of employees and the assistance of trade and industrial organizations and of scientific and technical experts.

The conference accordingly recommends that governments, public institutions, trade and industrial organizations or public opinion, as the case may be,

1. Should lead producers to direct their endeavors along the lines indicated above, and, in particular

(a) To encourage and promote in every way the investigation and comparison of the most adequate method and most practical processes of rationalization and of scientific management, and of the economic and social results obtained thereby.

(b) To apply these endeavors in industry, agriculture, trade and finance, not merely to large but also to medium and small undertakings, and even to individual workers and handicraftsmen, bearing in mind the favorable effects which they may have in household organization and amenities.

(c) To give special attention to measures of a kind calculated to insure to the individual the best, the healthiest and the most worthy employment, such as vocational selection, guidance and training, the due allotment of time between work and leisure, methods of remuneration, giving the worker a fair share in the increase of output, and generally conditions of work and

The American delegates of the World Economic Conference at Geneva and the expert advisers who accompanied them

Bottom row, reading from left to right: Henry Chalmers, chief of the foreign tariffs division of the Bureau of Foreign and Domestic Commerce; Dr. Arthur N. Young, economic adviser, Department of State; Roland W. Boyden of Boston, representing the International Chamber of Commerce; Dr. Julius Klein (delegate), director Bureau of Foreign and Domestic Commerce, Department of Commerce; Henry M. Robinson (chairman of the delegation), president First National Bank, Los Angeles; Norman H. Davis (delegate) formerly Assistant Secretary of the Treasury and Assistant Secretary of State; Alonzo E. Taylor (delegate), director, food research, Stanford University; Dana Durand, chief of the research division, Bureau of Foreign and Domestic Commerce.

Top row, reading from left to right: Dr. Louis Domeratzky, chief of the regional division of the Bureau of Foreign and Domestic Commerce; John P. Frey, editor *Molders' Journal*, adviser on labor questions; Edward Eyre Hunt of Washington, D. C., Department of Commerce; Grosvenor Jones, chief of the finance division, Bureau of Foreign and Domestic Commerce; E. W. Camp, commissioner of customs, Treasury Department, and W. L. Finger, secretary to Dr. Julius Klein, serving as administrative aid. John W. O'Leary, the fifth American delegate to the conference, is not in the picture.

life favorable to the development and preservation of his personality.

2. Should carry on systematically on an international as well as a national basis the standardization of materials, parts and products of all types which are of international importance, in order to remove the obstacles to production and trade which might arise from a purely national policy of standardization;

3. Should undertake on an international basis investigations for ascertaining the best methods employed and the most conclusive results obtained in every country in the application of the principles set out above, utilizing the investigations already made in certain countries and encouraging the exchange of information among those concerned.

4. Should spread in all quarters a clear realization of the advantages and the obligations involved in rationalization and scientific management as well as of the possibility of their gradual achievement.

OTHER RESOLUTIONS

With reference to the remaining resolutions, sufficient information has been given in articles already published in this paper to make repetition unnecessary here. The recommendations on commerce were lengthy, occupying, with explanations, thirteen printed pages of legal-cap size. They warrant the careful study of every American interested in foreign trade.

Two days before the closing of the conference the delegation from Russia, or from the Union of Socialist Soviet Republics, as they call it, demanded that there be a resolution recognizing the coexistence of the two economic systems, their own and that of the rest of the world, threatening otherwise to withdraw from the conference. A compromise was reached through the efforts of Roland W. Boyden of Boston, representing the International Chamber of Commerce. He introduced a resolution which declared that the conference recognized the importance of the renewal of world trade and that while refusing to infringe upon political questions regarded the participation of delegates from all the countries present, irrespective of differences in their economic systems, as a happy augury for a pacific commercial co-operation of all nations. This resolution adopted, the Soviet delegates were satisfied and they remained in the conference to the end, though they voted against all resolutions that ran counter to their economic system or practice.

95,374 Sq.Ft.

and

189 Applicants

That was the batting average of the A.E.R.A.'s Exhibit Committee on June 11.

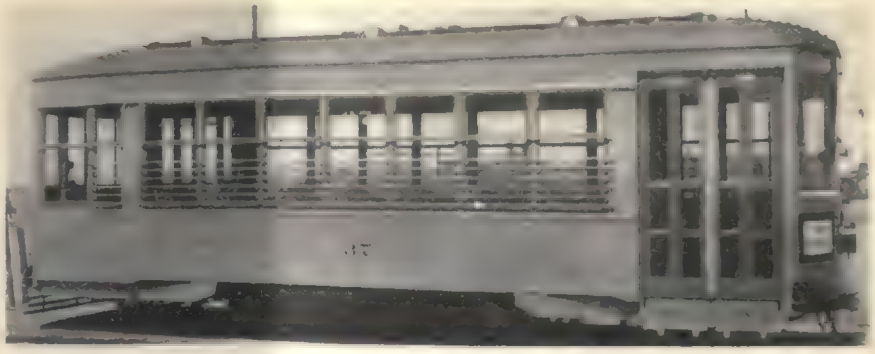
And yet another score!

Three Miles of Show Window Frontage,

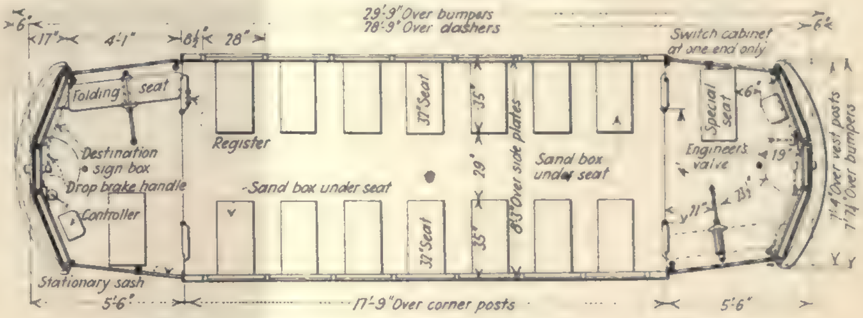
the finest the industry can command, has already been booked. Concentrated buyers plus maximum attention!

You Get It at Cleveland Oct. 3-7

New One-Man Cars Operating in Mobile, Ala.



Two of these 32-passenger one-man, double-end units are now serving the riding public at Mobile



Seating arrangement and general plan of new Mobile cars

Two one-man, city type, double-end cars were delivered to the Mobile Light & Railroad Company, Mobile, Ala., on May 2 by the American Car Company, St. Louis. Subjoined are specifications covering this equipment:

Number of units	Two
Type of unit	One-man, motor, passenger, city, double-end, single-truck
Number of seats	32
Weight, total	20,000 lb.
Length over all	29 ft. 9 in.
Length over body posts	17 ft. 9 in.
Truck wheelbase	8 ft. 6 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	10 ft. 4 in.
Window post spacing	2 ft. 4 in
Body	All steel
Roof	Arch
Doors	End
Air brakes	General Electric CP-27
Armature bearings	Plain
Axles	A.E.R.A. standard
Car signal system	Faraday
Compressors	General Electric
Control	K-63 BR
Couplers	Detached link and pin
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic Co.
Doors	Folding
Fare boxes	Johnson
Finish	Enamel
Gears and pinions	General Electric
Glass	Plate D. S. A.
Hand brakes	Brill drop handle
Headlights	Ohio Brass
Interior trim	Plain mahogany
Journal bearings	Plain MCB-Brill
Journal boxes	Brill
Lamp fixtures	General Electric
Motors	General Electric, No. 265, inside hung
Painting scheme	Yellow
Registers	International R5
Roof type	Arch
Roof material	Poplar tongue and groove
Safety car devices	Safety Car Devices Co.
Sash fixtures	O. M. Edwards
Seats	Brill
Seat spacing	29 in.
Seating material	Wood
Slack adjusters	Brill
Steps	Folding
Step treads	Feralun safety
Trolley catchers	Earll
Trolley base	U. S. No. 20-A
Trolley wheels	4 in. brass
Trucks	Brill 79-E-2
Ventilators	Brill
Wheels, type	Steel, diameter 26 in.
Special devices	H. B. life guards

Philadelphia Subway Signal Contract Awarded

Through its Department of City Transit Philadelphia has awarded a contract to the Union Switch & Signal Company, Swissvale, Pa., covering the complete installation of automatic block signaling, electro-pneumatic interlockings and automatic train stop equipment in the new Broad Street subway. This subway begins at the City Hall and extends northward 6 miles to Olney Avenue and Fern Rock yard, with the present layout embracing two tracks through this territory. The ultimate future arrangement will provide for four tracks throughout. Included under this contract are 264 color light signals, 93 interlocked switches, 117 electro-pneumatic automatic train stops, etc. Direct current at 630 volts will be used for propulsion purposes of the rolling equipment, with double rail return alternating-current track circuits through the entire block signaling territory. Six electro-pneumatic interlocking plants at City Hall station, Spring Garden Street, Girard Avenue, Erie Avenue, Olney Avenue and the yard portal will be installed, with two storage yard interlockings at Fern Rock, the northern terminus of the subway.

Contention of Toledo Torch Upheld

The United States District Court of the Northern District of Ohio, Western Division, in the case of Wilbert J. McCloskey, trading as McCloskey Torch Company, plaintiff, vs. the Toledo Pressed Steel Company, Toledo, Ohio, defendant, holds that U. S. Letters Patent No. 1,610,301, issued to Wilbert J. McCloskey on Dec. 14, 1926, is invalid as to all of the claims thereto and bill of complaint is dismissed in favor of defendant. This does not affect U. S. Letters Patent issued to the Toledo Pressed Steel Company covering its product the Toledo torch.

Lower Prices for All Metals

Lower prices characterize the domestic markets for all of the non-ferrous metals. Activity in lead has been well up to the average at prices only fractionally lower than a week ago. Zinc has been comparatively quiet, closing the week at 6.25 cents St. Louis. Tin has been moderately active, with prices off about ½ cent, and the copper market has been virtually dead, such sales as have been made in the last two days being at 12.50 cents delivered in the East. Quicksilver and antimony prices are lower, whereas platinum is practically unchanged. Silver has fluctuated within narrow limits, being quoted at 57 cents today. Buying of copper has been practically non-existent, aggregate sales being lower than for any week in the last two years at least. On June 9 two sales were made at 12.725 cents in Connecticut and subsequently several small orders were placed at as high as 13 cents delivered in the Middle West. However, the only sales of consequence since Saturday have brought only 12.50 cents for Connecticut delivery. Buyers, presumably, have been awaiting the appearance of the May statistics, which have just been issued.

With the volume of buying somewhat less than the average, zinc prices have ranged between 6.20 cents and 6.30 cents during the week, the closing price, 6.25 cents, being slightly lower than a week ago. Statistics issued by the American Zinc Institute in tons of 2,000 lb. show the following:

Stock, May 1	41,208
Produced	51,296
	92,594
Shipped	50,458
Stock, May 31	42,046
Shipped from plant for export	4,898
Total retort capacity at end of period	136,844
Number of idle retorts available within sixty days	53,749
Average number of retorts operating during period	79,846
Number of retorts operating at end of period	79,057

The American Smelting & Refining Company has all along maintained its contract price at 6.40 cents, New York, since May 26. On Thursday and Friday some business was done at five or ten points premium over this level, but in the last few days sellers have been unable to get any more than the Smelting company's price except for special lots. Forward lead sold as high as 6¼ cents, St. Louis, on June 9, and a good tonnage was also booked at 6.225 cents. Some sellers, however, were willing to book lead for delivery up to the end of July at no more than 6.175 cents on that day.

Rolling Stock

Houston Electric Company, Houston, Tex., has ordered twenty new street cars powered with four 35-hp. motors from the St. Louis Car Company. The new cars, one of which will be exhibited at the annual convention of the A.E.R.A., at Cleveland in the fall, seating more than 50 passengers, will be larger than any now in use in Houston, and will be of the most modern design, with clear-vision windshield and electric windshield wipers, many safety devices and fully upholstered. They will cost $17,000 each. It is reported that ten new buses have been ordered at a cost of $10,500 each.

Connecticut Company, New Haven, Conn., has ordered from Mack Trucks, Inc., three 29-passenger city type buses, 225-in. wheelbase, four-cylinder motors.

United Electric Railways, Providence, R. I., has ordered four 29-passenger, 233-in. wheelbase, six-cylinder city type Mack buses.

County Transportation Company, New York, bus operating subsidiary of the New York, Westchester & Boston Railway, has accepted delivery of two 29-passenger Mack city type buses, 225-in. wheelbase, four-cylinder motors. Operation in Westchester County will start with twelve buses of this type.

Washington Railway & Electric Company, Washington, D. C., recently purchased three street car type 21-passenger Yellow buses.

Illinois Power & Light Corporation, Peoria, Ill., recently bought seven street car type Yellow buses with a capacity for 21 passengers.

City Railway, Los Angeles, Cal., recently purchased six Yellow buses divided as follows: Four 29-passenger street car type buses on 230-in. wheelbase chassis and two 21-passenger street car type buses, all of Yellow base.

Pacific Northwest Traction Company, Seattle, Wash., has accepted delivery of three Fageol (Cal.) buses. Two of these are of the cupola observation type and the other is a regular observation type parlor car.

Los Angeles Railway, Los Angeles, Cal., has accepted delivery on four street car type buses manufactured by Fageol (Cal.)

Market Street Railway, San Francisco, Cal., recently bought a Fageol (Cal.) street car type bus.

Track and Line

Portland Electric Power Company, Portland, Ore., has received permission to replace the car tracks in Oregon City with the latest type of heavy rails, including the placing of a new concrete track base with cement instead of brick between the rails. Work is to go forward as soon as the new rails arrive. The cost is estimated at $50,000.

The Cincinnati Street Railway, Cincinnati, Ohio, started work June 1 on two additional major track reconstruction projects. One is on Anthony Wayne Avenue, from Lockland Avenue to Mills Avenue, and the other on Montgomery Road, from Blair Avenue to the Norfolk & Western Railroad. The work on Anthony Wayne Avenue involves 12,675 ft. of single track, at an estimated cost of $117,230, and the work on Montgomery Road, 6,253 ft. of single track, involving an expenditure of $66,467. The type of construction specified is 93-lb. T-rail, 7 in. high, on steel ties imbedded in concrete, and welded joints.

ELECTRIC RAILWAY MATERIAL PRICES—JUNE 14, 1927

Metals—New York

Copper, electrolytic, cents per lb.	12.50
Lead, cents per lb.	6.40
Nickel, cents per lb.	35.00
Zinc, cents per lb.	6.63
Tin, Straits, cents per lb.	67.75
Aluminum, 98 or 99 per cent, cents per lb.	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.475
Somerset mine run, Boston	1.875
Pittsburgh mine run, Pittsburgh	2.05
Franklin, Ill., screenings, Chicago	‡
Central, Ill., screenings, Chicago	‡
Kansas screenings, Kansas City	2.675

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 9/16 in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.95
Steel bars, cents per lb.	1.80
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb.	3.00
Sheet iron, galvanised (24 gage), cents per lb.	3.85
Galvanised barbed wire, cents per lb.	3.20
Galvanised wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12–17.50
Colored	7–14

‡ Quotations withdrawn because of strike.

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.6
White lead in oil (100 lb. keg), cents per lb.	13¾
Turpentine (bbl. lots), per gal.	$0.59
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.00
Rubber-covered wire, No. 14, per 1,000 ft.	$5.15-$5.20
Weatherproof wire base, cents per lb.	16.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y	1 00

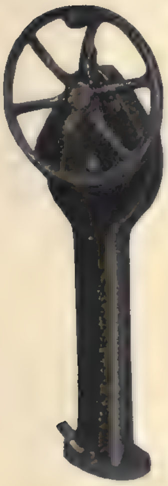
Old Metals—New York and Chicago

Heavy copper, cents per lb.	10.625
Light copper, cents per lb.	9.25
Heavy yellow brass, cents per lb	6.875
Zinc, old scrap, cents per lb.	3.875
Lead, cents per lb. (heavy)	5.375
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	15.25
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.00

Some Day Will Rogers

will get around to discussing Farm Relief, Baseball and Crime Waves seriously. He'll yell for direct action at the right time by men who are properly equipped.

When that day comes he would greatly strengthen his writings by reference to Peacock Staffless Brakes. They have everything needed to do their job when they are called upon. That is why they are standard equipment on most modern cars. Yours for 100% efficiency on every job especially stopping cars in emergencies.



Peacock
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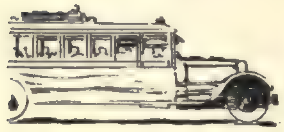
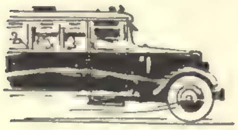
Staffless Brakes

National Brake Company

890 Ellicott Square Buffalo, N. Y.

Canadian Representative
Lyman Tube & Supply Co., Ltd., Montreal, Can.





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Nearly three times as many

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PHONO-ELECTRIC OVERHEAD IS A MEASURABLE ECONOMY

For Men who specify Trolley Wires

a little inside history well worth remembering

Any metallurgist could compound an alloy having the proportionate composition of Phono-Electric Trolley Wire. And yet it would not be Phono.

For even in these democratic times there are few who will deny the value of a manufacturing ancestry that goes back 60 years, with the added background of 30 years' experience in the craft.

Uniform quality comes as a natural result of this inborn "know how" of manufacture, safeguarded by equally experienced testing of all materials from warehouse to shipping room.

As an instance we illustrate the cold drawing operation by which Phono-Electric Trolley Wire is made. This in itself is a Spartan test, for the pull is 90% of the total tensile strength of the wire, and the slightest suggestion of the "give" that imperfections would cause, is promptly shown on a delicate electric recorder.

May we send the Phono Book? It deals exhaustively with the important question of modern overhead construction.

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"Bridgeport"
TRADE CO. MARK
Phono-Electric

Bridgeport Brass Company
BRIDGEPORT - CONNECTICUT

—city fares ride in parlor coach comfort

Fitzjohn bus bodies for city operation dispel all doubt as to the possibility of combining comfort with practicability for this class of service.

Months and years of gruelling travel over city streets, quick get-aways and quicker stopping in congested traffic—service that taxes bodies and chassis to the limit—finds the durability and strength of Fitzjohn bus bodies unimpaired, quiet and passenger inviting.

Rattly windows, banging fenders, squeaky seats do not compete for supremacy with the noisy din of the city. Run a Fitzjohn bus that has seen city service at its worst out into the highways beyond the clamor of town. *Listen* for trouble, and you'll quickly understand why more than 2000 Fitzjohn bodies are building goodwill and profits for their operators—why city fares ride in parlor coach comfort.

For whatever chassis you choose on your next bus order—there's a Fitzjohn body ready to help you build profitable passenger miles.

Fitzjohn
MANUFACTURING COMPANY
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Railways Buy—

In OKLAHOMA "The vehicles have been operated an average of about 4,000 miles per month and we have experienced no serious difficulty with them," writes the Oklahoma Railway Company. A repeat order from this Company was recently received.

In DALLAS "We are using this equipment as feeders to some of our street railway lines and are convinced that we made no mistake in purchasing Graham Brothers Buses," writes the Dallas Railway & Terminal Company, Dallas, Texas.

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SOLD BY DODGE BROTHERS
DEALERS EVERYWHERE

MOTOR

and Buy Again!

Repeat Orders Continue to Prove the Popularity of Graham Brothers Medium Capacity Motor Coaches—Good-looking, Sturdy, Dependable

Experience guides more and more street railway operators to the purchase of Graham Brothers Motor Coaches.

Operators who have had experience with Graham Brothers equipment know its reliability, its low costs, the dependable service facilities available and its business building qualities—good looks, comfort, speed, safety and frequency.

Many operators who have had experience with big, costly buses are purchasing Graham Brothers Coaches. They are medium capacity—permitting better headway at lower costs. They attract passengers. They stand up—mile after mile, year after year.

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EVANSVILLE – DETROIT – STOCKTON
A DIVISION OF DODGE BROTHERS, INC
GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONTARIO

21-Passenger Street Car Type, complete, $3815
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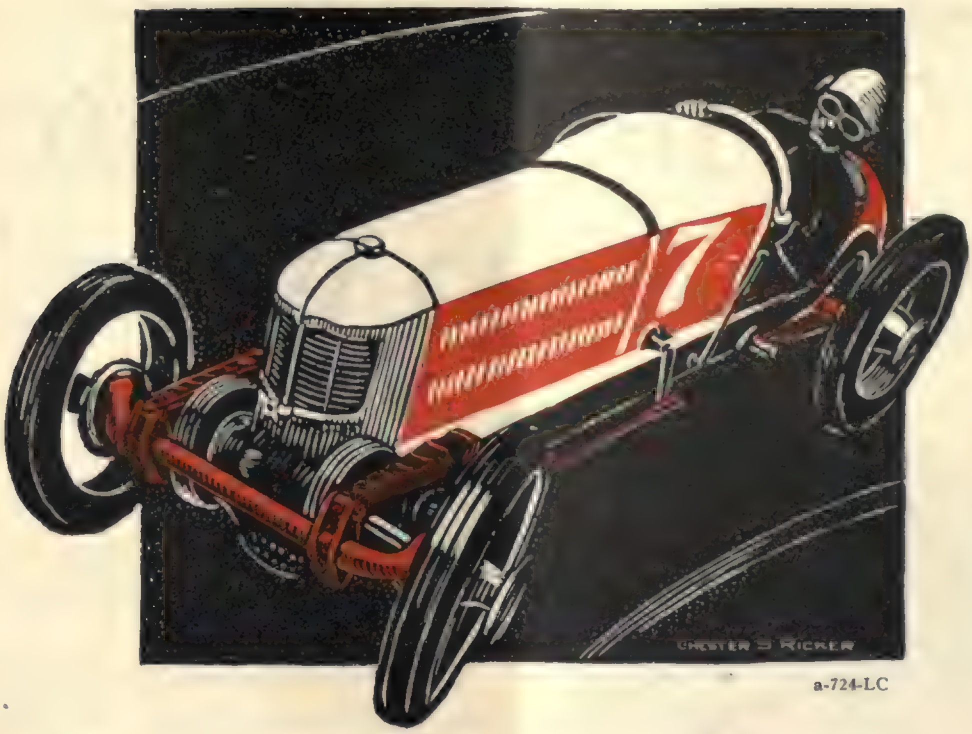
BALLOON tires for comfort? Sure. But how about the wear—and the punctures? . . . India writes that answer clear. Here in this enlarged cross-section of an India Balloon tire showing India's patented construction, the extra mileage is easy to see. Two extra plies of cords under the tread take care of the wear and the punctures. The standard thickness of sidewall gives the added comfort for which balloon tires were designed. . . . India Balloons and Bus Balloons, made on the same principle but with more plies, used with the True-Blue (HEAT-PROOF) Inner Tubes (another exclusive India feature) give the utmost satisfaction you can buy in balloon tires.

India Tire & Rubber Company, Akron, Ohio

INDIA
TIRES



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Leading the Field

Just as super-charged, front wheel drive racing cars are the most up-to-date development in Racing, so the "Ricardo" type combustion chamber is one of the most advanced engineering achievements in the automotive industry. The "Ricardo" Head gives predetermined control of combustion so that maximum power can be obtained from the minimum amount of fuel without that engine-wrecking "ping" or detonation common to conventional "Ell" head engines. Briefly it gets "valve-in-the-head" power out of the simple "Ell" head type of engine without "ping."

America's leader in the six and eight cylinder car class using "Ell" head engines has the "Ricardo" combustion chamber and is licensed by the Waukesha Motor Company, owners of the Ricardo patent. The Waukesha Motor Company is the largest builder of heavy duty Bus, Truck and Industrial Engines in the world. When you need an engine that will give long life, with low maintenance cost think of Waukesha, the Engines that have "Ricardo" Heads.

(A-741-LC)

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WAUKESHA MOTOR COMPANY

Waukesha **Wisconsin**

Eastern Sales Offices *Eight W. 40th Street* *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

TO THE OPERATORS WHO WANT TO

To meet the growing demands of operators of bus and coach lines, Fisk engineers have designed, Fisk craftsmen have produced, a complete line of Fisk Tires, solids and pneumatics, for every service requirement, for every road condition.

Motor Coach Balloon

Pliant, strong, with a thick, tough tread, this tire insures maximum comfort and maximum safety in bus service, throughout surprisingly long mileage.

Time to Re-tire
Get a FISK
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FISK TRUCK TIRES

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THE TRANSPORTATION CORD
THE MOTOR COACH BALLOON

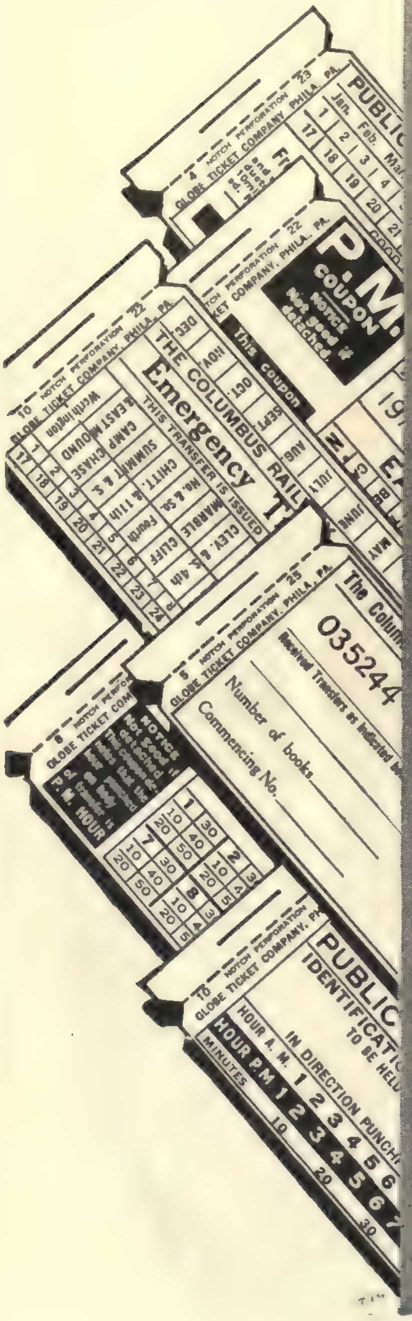
"Fisk Says It With Mileage"

THE FISK TIRE CO., INC.
Chicopee Falls, Mass.

The Fisk Heavy Duty Transportation Cord

Built by a patented process, this husky pneumatic meets the exacting demands of busses, trucks and all types of delivery vehicles.

FISK TRUCK TIRES



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There is a Globe Transfer to meet every possible problem: Transfers showing various methods of dating, from the serial date showing the day of the week, month and year to the OK Symbol System; transfers showing many different ways of limiting the time a transfer is valid; transfers especially designed to put a definite check on the round-tripping evil.

If you are not using our service, we shall appreciate an opportunity to give you full particulars. For accuracy, promptness and scope of service, the prestige of our organization is world-wide.

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REMARKABLE as are all the processes through which the steel passes before it becomes an Empire bolt, the heat treatment is the most dramatic and perhaps the most important. This process, known as the Smith heat-treating process, is based on a principle new to the steel industry, and is the secret of the high tensile strength of the Empire New Process Bolt. Every bolt unfailingly tests over 80,000 lbs., an increase of about 15,000 to 20,000 lbs. over the ordinary bolt.

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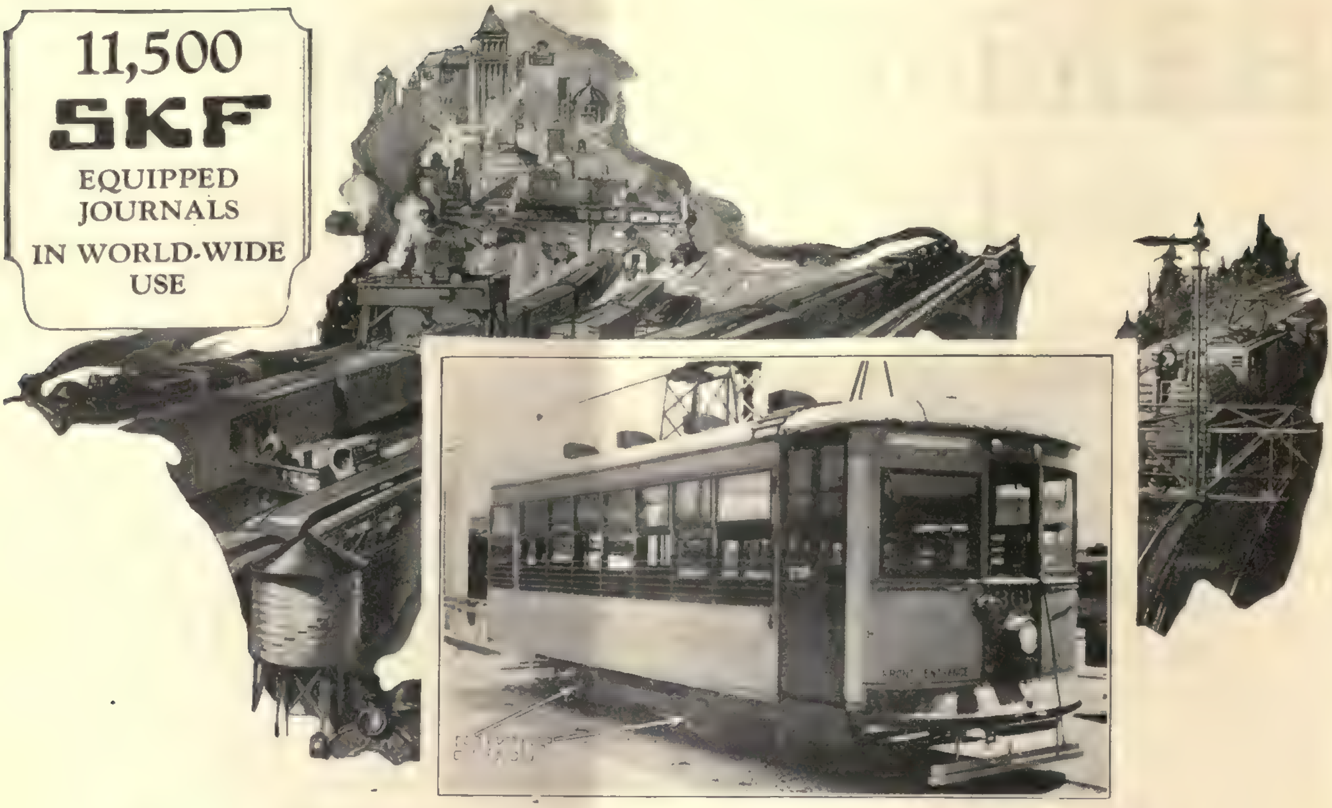
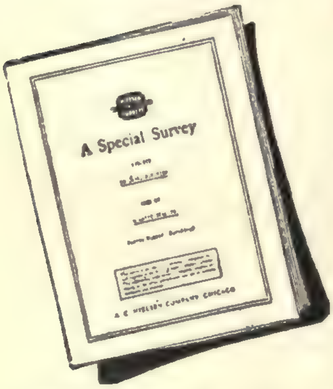
IN WORLD-WIDE
USE



Easy Riding and Less Maintenance with SKF Bearings on Journals and Motors



Certified Survey No. 1822 in your Industry or one closely related to it Sent on Request.

"IT takes rough and uneven track with less oscillation than other cars of the same type and—the riding and running qualities of car No. 361 are superior to other single truck safety cars we are operating," states the Master Mechanic of a Texas street railway where the above SKF-equipped car has been giving satisfactory service over two years. That's why trainmen show considerable preference for this car and passengers are assured a comfortable ride.

SKF anti-friction bearings are used on the journals and motors. From an operating standpoint these bearings effect material economies. They do not require any adjustments, and freedom from wear assures long life. Housings are designed to effectively exclude all dust, grit and moisture from the bearings. Replenishing of lubricant is only required about three or four times a year.

SKF INDUSTRIES, INCORPORATED
40 East 34th Street, New York City

1822

More than 100 Factory Offices Throughout the World
SKF
Puts the Right Bearing in the Right Place

Ball Bearings

Roller Bearings

The *one* tire that will carry the load and stand up under express speed--the *Heavy Express Special* --specially built for the job.

—better buy Generals NOW than *buy and buy*

The
GENERAL
TIRE
—goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.

INDUSTRIAL ADVERTISING
Opened the Door

MORSE pleaded with ten Congresses before his telegraph received any attention.

BELL nearly starved while the people laughed before the possibilities of his telephone were recognized.

Handicapped by a lack of prestige or influential introduction! The uphill struggles of these pioneers would have been much easier if in some way they had first gained the confidence of the minds they sought to sway.

The same situation exists in Industrial Selling. When an idea runs counter to established custom, although it be sound as gold, it needs an influential introduction to gain recognition for itself.

Morse & Bell Up to Date

A manufacturer sought to make Industry reverse its thinking and adopt a method which would revolutionize its production methods. His opposition was the groove of custom and the lack of recognition or influential approval. His allies were economy and speed in manufacture and strength in fabricated product. Nothwithstanding a meritorious idea little progress was made until the manufacturer added another ally—the sound use of Industrial Advertising.

For this purpose 3% of gross sales was appropriated. Advertising copy that especially recognized Industry's common trait to accept nothing new without careful weighing and deliberation, was persistently published in McGraw-Hill Publications reaching the industries which could profit from the new method.

Before a year was out many worthwhile installations of the revolutionary process were made. Prospective users openly stated that they eagerly watched these publications for each new advertisement in the campaign.

Changes An Industrial Practice

The surface is but scratched although the process is being rapidly extended. The Industrial Advertising carries on, writing on the wall another great change in industrial practice.

It is a curious anomaly that the eagerness of Industry for better products and methods is obstructed by disinterest and even suspicion when new ideas are not supported by the influential introduction that Industrial Advertising can give them.

McGraw-Hill Publications, possessing the confidence of industrial readers, provide the influential introduction which turns indifference into recognition. A study of the McGraw-Hill Four Principles of Industrial Marketing shows how Industrial Advertising holds the power to open buyers' doors and minds. McGraw-Hill, with its reservoir of data and experience, may be freely consulted by any manufacturer or his advertising agency in coping with all phases of industrial marketing problems.

A new book, "Industrial Marketing at Work," has just been published to show how to make a step-by-step application of these Four Principles. If Industry is your customer this book will help establish your advertising and selling on a foundation of certainty. Ask the nearest McGraw-Hill office to deliver a copy.

McGRAW-HILL PUBLISHING COMPANY, INC., NEW YORK, CHICAGO, PHILADELPHIA, CLEVELAND, ST. LOUIS, SAN FRANCISCO, LONDON PUBLISHERS OF

McGRAW-HILL
Publications

Electrical
ELECTRICAL WEST
ELECTRICAL WORLD
ELECTRICAL MERCHANDISING

Construction & Civil Engineering
ENGINEERING NEWS-RECORD
CONSTRUCTION METHODS

Industrial
POWER
AMERICAN MACHINIST
INDUSTRIAL ENGINEER
CHEMICAL & METALLURGICAL ENGINEERING

Catalogs and Directories
COAL FIELD DIRECTORY
RADIO TRADE CATALOG
ELECTRICAL TRADE CATALOG
CENTRAL STATION DIRECTORY
ELECTRIC RAILWAY DIRECTORY
KEYSTONE COAL BUYERS CATALOG
KEYSTONE COAL MINING CATALOG
ELECTRICAL ENGINEERING CATALOG
KEYSTONE METAL QUARRY CATALOG
ANALYSIS OF METALLIC AND NON-METALLIC MINING, QUARRYING AND CEMENT INDUSTRIES
BONBRIGHT SURVEY OF ELECTRIC POWER & LIGHT COMPANIES IN THE U. S.

Radio
RADIO RETAILING

Transportation
BUS TRANSPORTATION
ELECTRIC RAILWAY JOURNAL

Mining
COAL AGE
ENGINEERING & MINING JOURNAL

Overseas
INGENIERIA INTERNACIONAL
AMERICAN MACHINIST
(EUROPEAN EDITION)

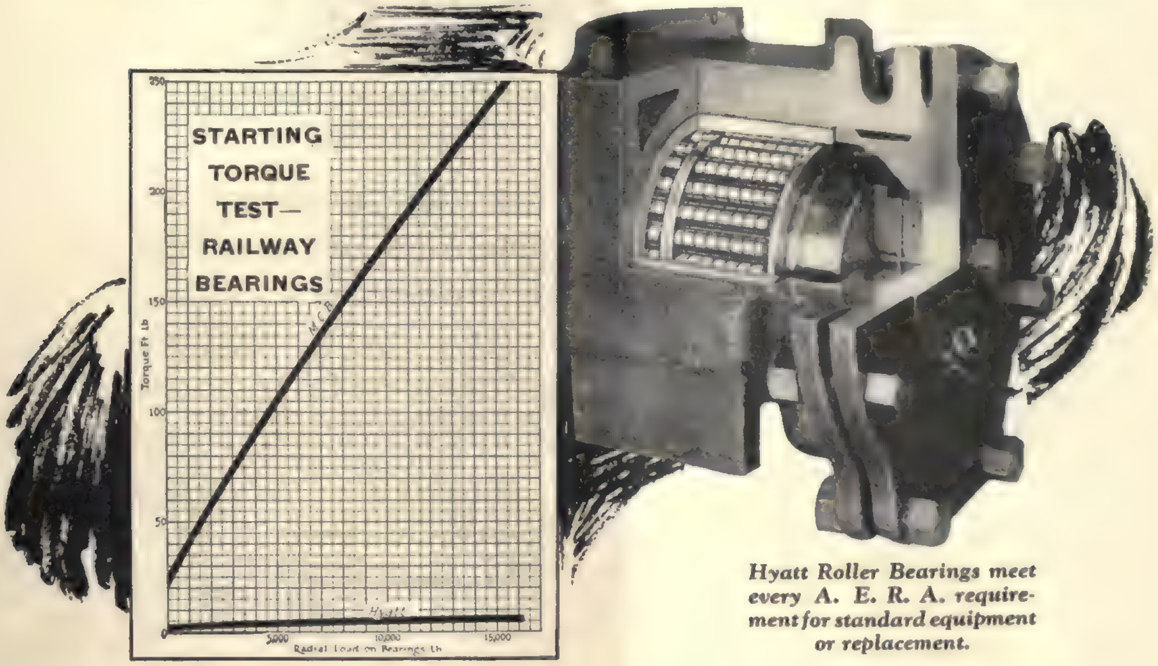
45,000 ADVERTISING PAGES USED ANNUALLY BY 3,000 MANUFACTURERS TO HELP INDUSTRY BUY MORE EFFECTIVELY

KELLY-SPRINGFIELD Bus Balloons give bus passengers the same kind of comfort that they get in their own cars equipped with regular Kelly Balloons. Kelly Bus Balloons enable bus operators to be comfortable in the knowledge that their mileage costs are not increased by giving their patrons this added service.

KELLY-SPRINGFIELD TIRE CO.
General Motors Bldg. New York, N. Y.

KELLY SPRINGFIELD BUS BALLOONS

Why Hyatt Roller Bearings are preferred in railway service



Hyatt Roller Bearings meet every A. E. R. A. requirement for standard equipment or replacement.

Faster Acceleration

The comparative test recorded above between Hyatt Roller Bearings and standard bronze bearings indicates conclusively the distinct advantages of Hyatt acceleration.

Loads up to the maximum axle rating and speeds were employed.

Quick get-aways on Hyatts help maintain schedules. When running, too, there is practically no friction. Less power is consumed. Less attention is needed.

Include Hyatt performance and economies in all your cars—even those now in service.

HYATT ROLLER BEARING COMPANY
Newark Detroit Chicago Pittsburgh
Worcester Philadelphia Oakland Cleveland

HYATT
ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

The Canadian Fairbanks-Morse Company, Ltd., Distributors of Hyatt Railway Bearings in Canada

AN EXTRA MARGIN OF DURABILITY

—is built into all "Standard Steel Parts." This means not only longer life, but lower maintenance and larger earnings to the car so equipped. There is less time lost in the shop—less trouble on the road—and a corresponding increase in net revenue. It is not only safe, but sound economy to specify "Standard Steel" armature shafts, wheels, axles and springs.

STANDARD STEEL WORKS COMPANY
Philadelphia, Pa.

BRANCH OFFICES
CHICAGO ST. LOUIS
NEW YORK HOUSTON
PORTLAND RICHMOND
SAN FRANCISCO ST. PAUL
PITTSBURGH MEXICO CITY
WORKS: BURNHAM, PA.

not a knock in it~

but hundreds of boosts

The Dayton Mechanical Tie Co.,
DAYTON, OHIO

Dayton Ties Bring Boosts —Not Knocks

GENTLEMEN of the Electric Railway Industry, were you to visit Dayton, we should be glad to open to you our 1926 correspondence file—or that of any other year.

It would be a revelation, for in all the correspondence with customers, you could not find a single solitary complaint about Dayton Ties—nothing but boosts, and hundreds of them.

We believe that to be a business phenomenon, for the usual mechanical product cannot avoid some complaints.

Dayton Ties will solve your track problem for years to come. Since their inception 15 years ago, no Dayton Tie has ever cost or caused a penny of track maintenance—track is as smooth today as ever.

It is the inherent construction of Dayton Ties which makes such records possible. By so building the tie that vibration can never reach the concrete foundation, we entirely eliminate crumbled concrete—the main cause of track failure.

The Dayton Mechanical Tie Co.,
Dayton, Ohio.

Safety—
with
maximum
mileage

Cambria
Wheels & Axles
for
Electric Railway
Service

Other Bethlehem Products for Electric Railways:

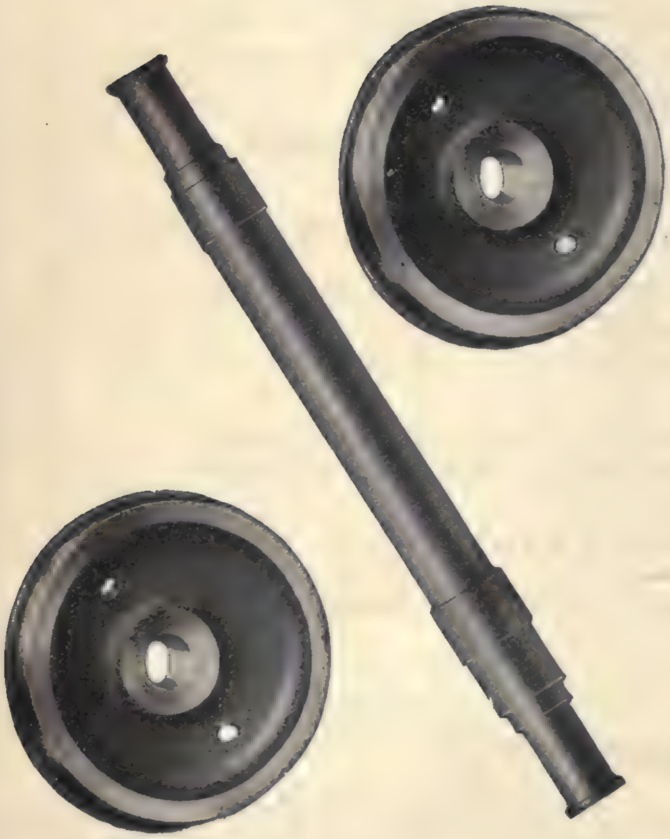
Axles, bolts, frogs, rails, armature shafts, pole line material, special layouts, switch stands, gear blanks, gage rods, splice bars, switches, crossings, guard rails, tie plates, tie rods, trackwork, and spikes.

BETHLEHEM STEEL COMPANY
General Offices: BETHLEHEM, PA.

District Offices in New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Cincinnati, Chicago, Detroit, St. Louis, San Francisco, Los Angeles, Seattle, Portland.

Bethlehem Steel Export Corporation, 25 Broadway, New York City Sole Exporter of our Commercial Products.

BETHLEHEM



Lubrication and Production

IN THE modern industrial world, there is a constant demand for greater and greater speed of production. Present day conditions and keen competition require that every unnecessary delay be eliminated.

Every time a piece of machinery is stopped for repairs, there is a direct loss of money. In addition to the actual cost of the repairs, the production of the machine is lost while it is out of service, and in many cases the operator of the machine is idle until the repair work is completed.

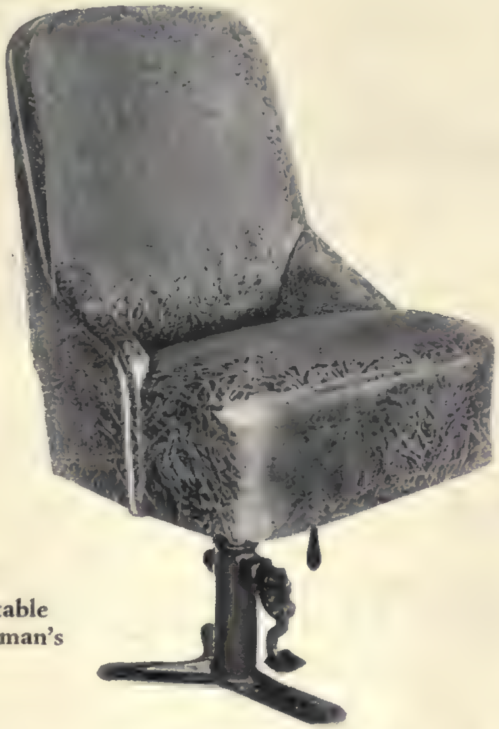
To keep production at the maximum speed in your plant, use

Standard Oils and Greases

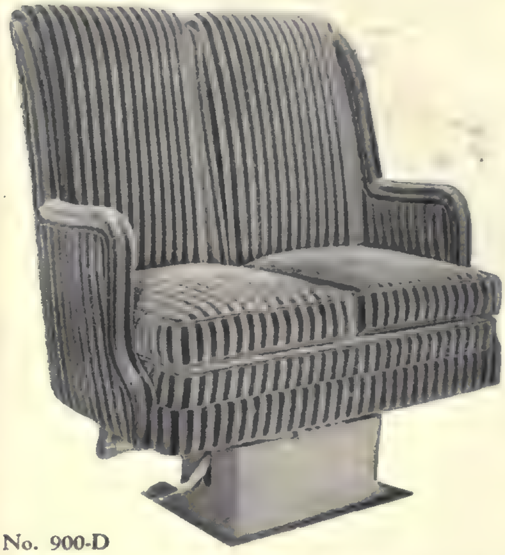
Standard Oils and Greases save your machinery and reduce repair work to the lowest possible point by furnishing correct lubrication. They are made in many grades to suit the lubrication requirements of all machinery used in the industrial world.

Our representative in your city is thoroughly familiar with modern industrial machinery, and will recommend the correct grades for your equipment.

STANDARD OIL COMPANY
(Indiana)
910 South Michigan Avenue Chicago, Illinois



No. 24
Adjustable Motorman's Seat



No. 900-D

Double Rotating Chair

Exceptional comfort for both motorman and passenger

IT is a profitable investment to provide comfort for the motorman as well as for the passenger—especially on long interurban and suburban runs. With this in mind Hale-Kilburn has recently designed an adjustable seat for motormen, No. 24. A foot pedal provides for raising and lowering the seat. It may also be moved backward and forward. A reversible feature enables a passenger to use this seat when the motorman is at the opposite end in double end vehicles. The back is shaped to give proper support. The cushion is fitted with deep springs and pitched at the correct angle to allow easy driving. Covered in any desired material.

The de luxe H-K No. 900-D rotating chair for passengers has curved back, heavily padded, individual spring cushion seat pads, individual arm rests at each side, and pedestal device for rotating to opposite position. It is plush covered, luxurious and comfortable.

Send for the H-K Catalog to get full particulars of our complete line of seats for every service.

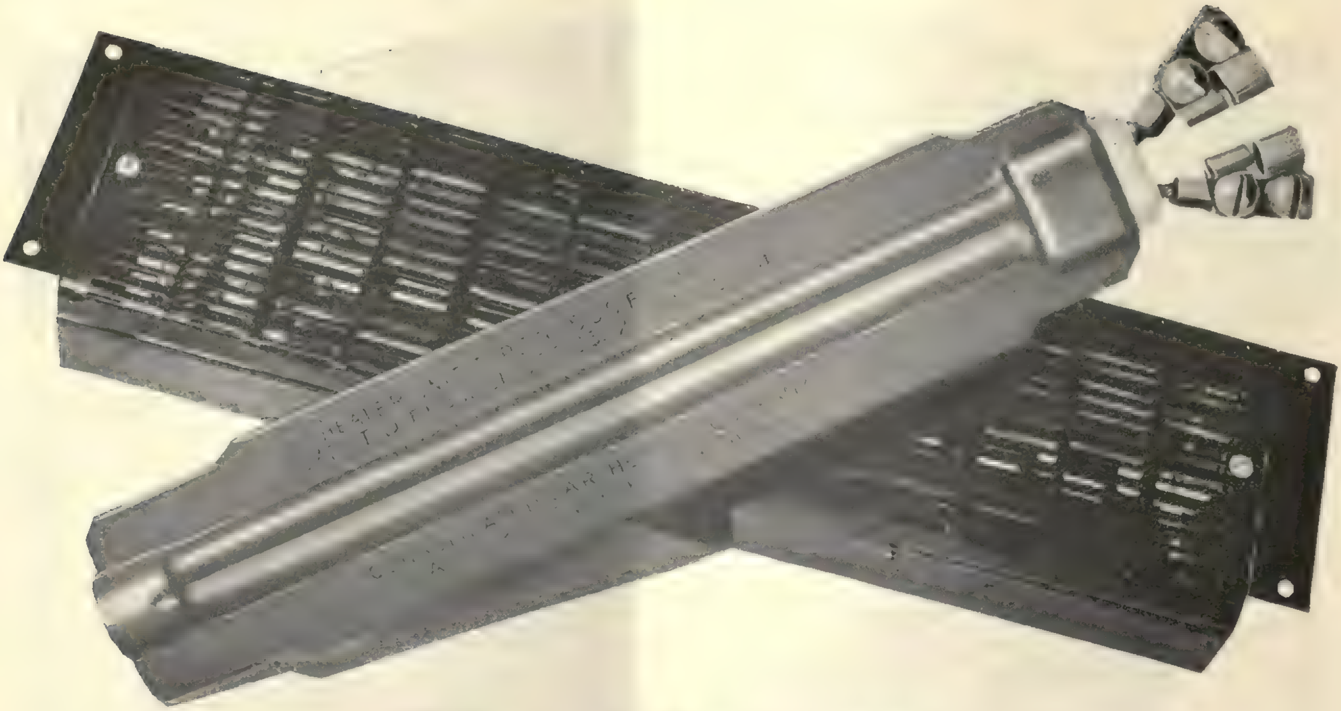
HALE-KILBURN COMPANY
General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco

T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS



The Element *behind* Consolidated Sheath Wire Heaters

An exclusive feature of Consolidated Enclosed Element Car Heaters is the G. E. Helicoil Sheath Wire heating unit, specially designed for railway service.

This heating element, originated and perfected by the General Electric Company, consists of a coil of heavy nickel chromium wire surrounded by a dense, highly compacted insulating power, which insulates the heating wire from sheath or casing. As the heating elements are run at a relatively low temperature, brass sheathing is used, thus providing a non-corrosive and non-magnetic material for the casing.

These elements are particularly adapted to car-heating work, being rust-proof, non-magnetic and withstand distortion and mechanical strain without injury.

Approved by the Underwriters' Laboratories.

G. E. Helicoil Sheath Wire Features:

Rust-proof and non-magnetic.

Does not deteriorate under vibration.

Withstands distortion and mechanical strain without injury.

Rugged terminals with two binding posts.

CONSOLIDATED
CAR-HEATING CO.
ALBANY,
N. Y.

When your Engineer says—
"Thermit weld"—

he will spend only a fraction of what your modern cars cost.

He does not disparage the modern car movement. Not in the least. Indeed, the most outstanding advocates of up-to-date equipment are the engineers.

But these engineers are urging modern track construction and modern maintenance methods, too. They know that the light weight, high-speed car will pound itself to pieces running over bad joints. They know that rail joints soon cup and work loose. That is why they say "Thermit Weld."

The cost of repairing several miles of track by Thermit welding is less than the cost of a single modern car. The difference in cost between Thermit welding, and the cheapest possible substitute method of repairing joints on existing track is so slight, that the price of one modern car would pay this difference for an entire moderate sized railway system.

METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.

PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

VIZABLEDG
PATENTED
SAFKAR
TRADE MARK REG
SAFSTEP

Slip-Proof, Miss-Proof Wear-Proof

Every traction man knows that these three qualities in a car step have a definite and substantial dollars-and-cents value. The **Irving "Safkar" Safstep**— with its non-slipping surface, its always-visible edge, and its all-steel construction—will give you this value, 100%.

In addition, the **"Safkar" Safstep** speeds up traffic— keeps the car floors cleaner— requires no maintenance beyond an occasional painting— lasts for the life of the car.

Made in both folding and rigid types, there's a size to suit your equipment— each a self-contained unit easily and quickly installed.

Ask us for Bulletin D-28

IRVING IRON WORKS CO.
LONG ISLAND CITY, N.Y. U.S.A.
Established in 1902

ATLANTA GA BALTIMORE MD BIRMINGHAM ALA BOSTON MASS BUFFALO N Y CHICAGO ILL CINCINNATI OHIO
CLEVELAND OHIO DALLAS TEXAS DENVER COLO DETROIT MICH EL PASO TEXAS HAVANA CUBA HOUSTON TEXAS
INDIANAPOLIS IND KANSAS CITY MO KNOXVILLE TENN MEXICO CITY MEX MILWAUKEE WIS MINNEAPOLIS MINN MONTREAL P Q
PHILADELPHIA PA PITTSBURGH PA ST LOUIS MO SAN FRANCISCO CAL SALT LAKE CITY UTAH SEATTLE WASH SCRANTON PA UTICA N Y

Car Shop Efficiency and Lubrication

It goes almost without saying that the more efficiently a car shop is operated, the more cars will be kept on the road. Supervision of the work in the shop to keep men and machines working at full capacity is the golden rule.

But the machine must be in a position to respond fully. There is where correct lubrication—the Texaco kind—enters. We say the Texaco kind advisedly, for we have the proof—the only proof that counts—*results*—to back this up. Texaco shop lubricants have a record of performance in shops of all kinds, and numbers of builders of machine tools and equipment, such as lathes, planers, boring mills, drills, presses, cranes, etc., recommend Texaco Lubricants, because they are satisfied that Texaco will aid the record of the machines they make and sell.

Supporting and enhancing the excellence of Texaco Shop Lubricants is the service of Texaco Lubrication Engineers.

Our staff includes experts on shop lubrication, who will make a survey of your shop and tell you which Texaco Lubricant to use for the various machines and parts.

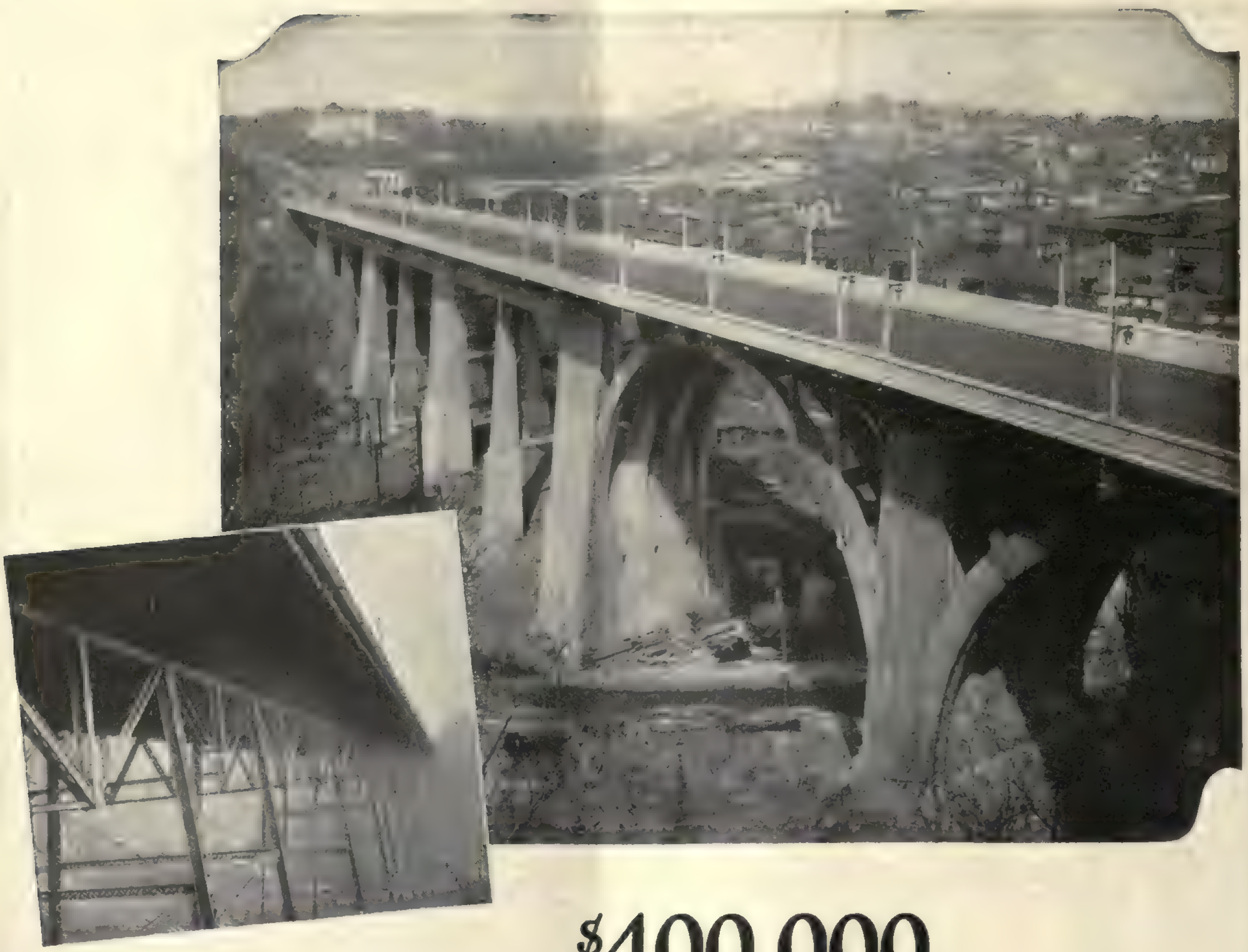
Through efficient recommendation it is more than likely that they will be able to show you how to do the work with fewer lubricants.

This is helpful in more ways than one. It decreases the chances of confusion; it decreases the storage space necessary; it simplifies orders on the Supply Department for oils; it assists in the better operation of machines through standardization of methods of selection and application of lubricants.

Let us assist you in securing topnotch shop efficiency through correct lubrication.

There is a Texaco Lubricant for Every Purpose

THE TEXAS COMPANY
Texaco Petroleum Products
Dept. E-62 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES



$400,000

Saved by Using Concrete!

Beck Memorial Bridge, Lynchburg, Va. Completed November 1926. Length, 908 feet. Maximum height, 135 feet. The 60-foot roadway carries a double street car track.

Planned and built under the direction of Allen J. Saville, Consulting Civil Engineer, Richmond, Va., and A.C. Janni, Consulting Engineer, New York City. J. F. Hough, Engineer in Charge of Construction. Whiting-Turner Construction Co., Baltimore, Contractors.

WHEN the wrought iron viaduct in Lynchburg, Virginia, proved inadequate to the increasing demands of modern traffic, estimates were made for an entirely new structure to cost approximately one million dollars.

The engineers, however, after a very thorough study recommended a *reinforced concrete* structure utilizing a large part of the original bridge. Their plan was adopted, with the result pictured above.

Except in the case of the arches in the foreground, the new bridge contains within the concrete members shown, the original wrought iron viaduct. The cost of the new structure was $600,000—a saving of $400,000 over the first estimate. Pedestrian traffic was never stopped and vehicular traffic was only stopped about one-half of the time of construction. This condition could not have been possible if the bridge had been made of any other material.

Truly an outstanding example of the possibilities of portland cement concrete as an aid to engineering skill.

PORTLAND CEMENT *Association*

Concrete for Permanence

CHICAGO

American Steel and Wire Company

A Bond of the Past

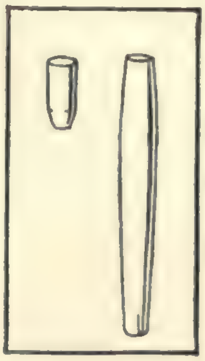
- of the Present

-and of the Future

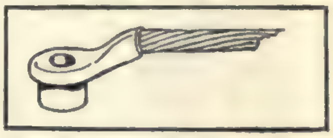
Various types of bonds have been developed to simplify installation without sacrificing performance, but none have met with greater favor than the Pin Terminal Rail Bond.

No cumbersome machinery or special tools are required to install this type of bond. A few blows from a hammer and the rail is efficiently bonded:—as simple as driving a nail. The only requisite for a lasting contact is a clean hole of proper size.

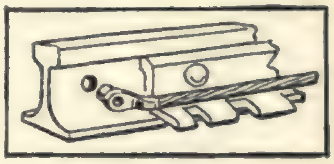
For the future:—high electrical conductivity and simplicity of application, assure extension of the use of Pin Terminal Rail Bonds.



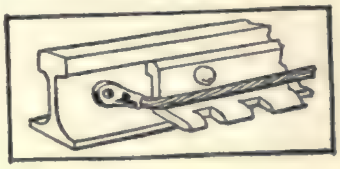
The pin and taper punch



The bond



The bond in position for application. Drive the taper punch through, then the permanent pin.



The bond installed. What can be easier?

SALES OFFICES

CHICAGO . 208 So. La Salle Street
CLEVELAND . . Rockefeller Bldg.
DETROIT . . Foot of First Street
CINCINNATI . . Union Trust Bldg.
MINNEAPOLIS—ST. PAUL Merchants Nat'l Bk. Bldg., St. Paul
ST. LOUIS . . . 506 Olive Street
KANSAS CITY . 417 Grand Avenue
OKLAHOMA CITY First National Bank Bldg.
BIRMINGHAM . Brown-Marx Bldg.
MEMPHIS Union and Planters Bank Bldg.
NEW YORK . . 30 Church Street
BOSTON . . 185 Franklin Street
PITTSBURGH . . . Frick Bldg.
PHILADELPHIA . Widener Bldg.
ATLANTA . . 101 Marietta Street
WORCESTER . . 94 Grove Street
BALTIMORE . 32 So. Charles Street
BUFFALO . . 670 Ellicott Street
WILKESBARRE . . Miners Bldg.
DALLAS . . . Praetorian Bldg.
DENVER . First National Bank Bldg.
SALT LAKE CITY. Walker Bk. Bldg.

Cincinnati Railway is cost wise , , ,

The Cincinnati Street Railway is winning a distinguished reputation by pioneering a campaign to apply scientific management to bus operation. Its inspection methods and cost finding practices have received very favorable comment in the press.

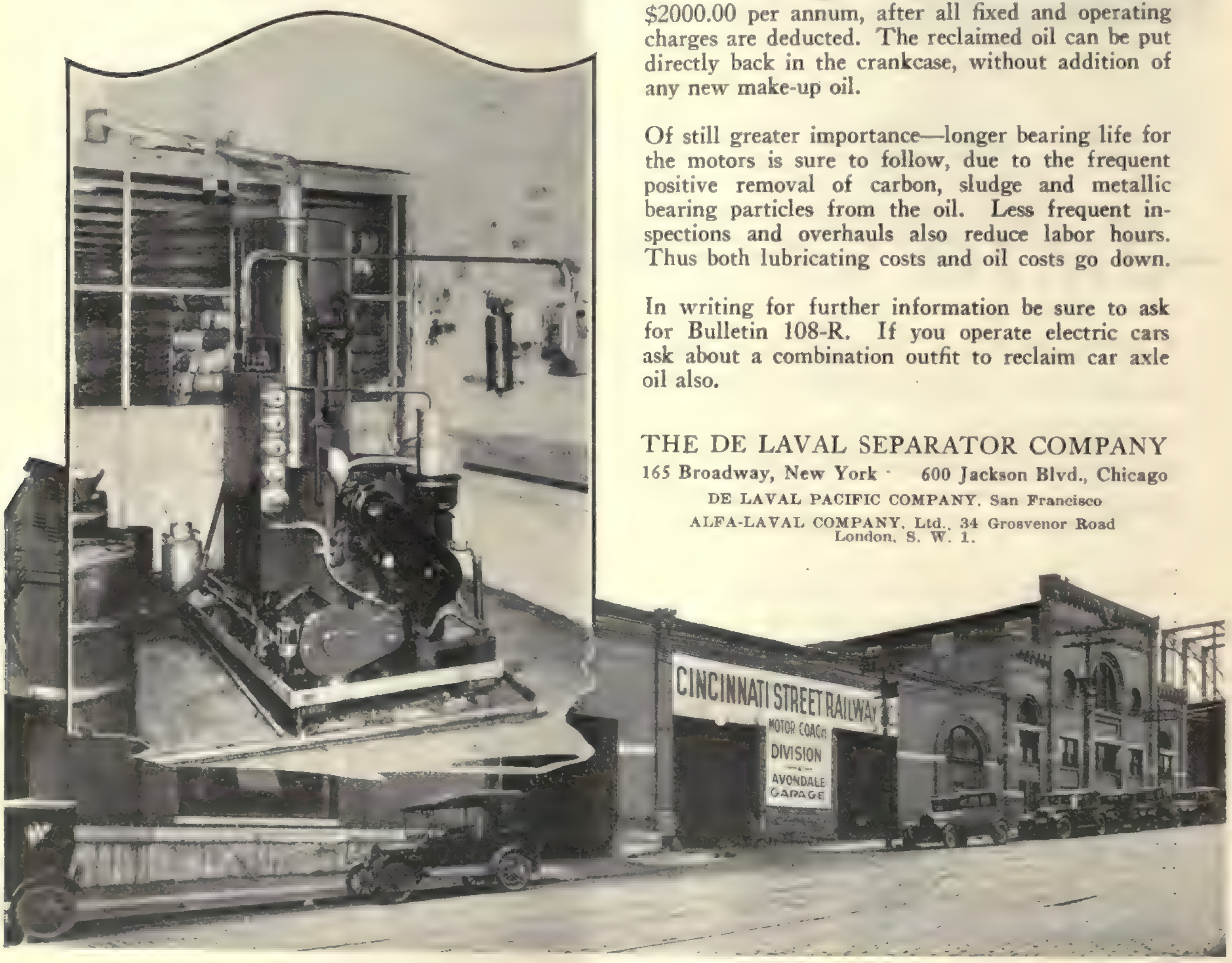
One thing that has been discovered is that there is a vast difference between oil costs and lubricating costs. Lubricating cost is the amount actually paid for oil *plus* the cost of repairs made necessary by inefficient lubrication. Certainly dirty, diluted oil cannot lubricate properly.

Filling its niche in this new scheme of things, then, is a De Laval Crankcase Oil Reclaiming Outfit (illustrated). A conservative estimate on the operation of this equipment based on results so far obtained predicts a reclamation of 80% or more of the crankcase drainage at an approximate saving of $2000.00 per annum, after all fixed and operating charges are deducted. The reclaimed oil can be put directly back in the crankcase, without addition of any new make-up oil.

Of still greater importance—longer bearing life for the motors is sure to follow, due to the frequent positive removal of carbon, sludge and metallic bearing particles from the oil. Less frequent inspections and overhauls also reduce labor hours. Thus both lubricating costs and oil costs go down.

In writing for further information be sure to ask for Bulletin 108-R. If you operate electric cars ask about a combination outfit to reclaim car axle oil also.

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York · 600 Jackson Blvd., Chicago
DE LAVAL PACIFIC COMPANY, San Francisco
ALFA-LAVAL COMPANY, Ltd., 34 Grosvenor Road
London, S. W. 1.



DE LAVAL

Crankcase Oil Reclaiming Outfit

Car Axle Oil Reclaiming Equipment Transformer Oil Purifiers

Presenting—

Type GUS-2
Gas Weld Bonds

Type GUS-2 Gas Weld Bonds are designed for application to the ball of the rail. Application, by the gas weld process, is extremely simple. Results are uniformly reliable.

The bonds are constructed entirely of copper. The conductor wires are firmly gripped where they enter the terminal. At the welding surface the wires are loosely held. This minimizes the danger of crystallization and wire breakage due to rail vibrations. Twin cables provide ample flexibility to meet all kinds of rail joint conditions.

The conductor wires extend through the terminal thus making certain that all wires will be included in the weld to the rail. The bond terminals are so shaped that it is easy for the welder to get a contact area with the rail that is six to eight times the conductor area.

Naturally, with a bond of this character, the result is unusually efficient bonding.

Samples of this bond will be gladly furnished. To whom shall we send them?

To obtain the strongest weld we recommend the use of Erico GW-1 gas welding rod.

ELECTRIC RAILWAY
IMPROVEMENT COMPANY

2070 E. 61st Place, Cleveland, Ohio

GERARD SWOPE

BUSINESS PAPERS
—spokesmen for industry

"THE interpretation of the ethics and ideals of business and industry to the public," said Gerard Swope, president of the General Electric Company, at the last Associated Business Papers Convention, "can have no better mouthpiece, can have no better spokesman, than the technical and business press."

This publication you hold in your hand is a business paper. The publisher and his editors and advertising men are a part of the industry which they serve intimately, acquainted with the technical, professional, or trade practices and methods of that industry, or business or vocation.

The editors pick out of the many phases of the flow of trade, news and policy trend in methods or machinery which will best serve the reader's needs. The advertising pages are a huge many-leaved coupon on the editorial section. And above all, the paper as a whole seeks to express the higher purposes and objectives of the small and large business men it serves.

For as Mr. Swope further said in his fine analysis of industry responsibility in this same address:

"It isn't necessary to be big to be successful, but it is absolutely essential to be successful to be big. You can't grow without that."

ABP

The A. B. P. is a non-profit organization whose members have pledged themselves to a working code of practice in which the interests of the men of American industry, trade and professions are placed first—a code demanding unbiased editorial pages, classified and verified paid subscribers, and honest advertising of dependable products.

This publication is a member of
THE ASSOCIATED BUSINESS PAPERS, INC.

Lasting Strength

Counts Big When Storms Rage

LASTING strength is the outstanding feature of *International* Creosoted Pine Poles.

There is no gradual decrease in strength due to decay or weakening due to birds or termite attacks. When storms rage and the greatest strains come, they are conquered by the full strength of Yellow Pine—the strongest of pole woods.

When you build your line — build with *International* Creosoted Pine.

International Creosoting & Construction Co.
General Offices—Galveston, Texas

International Creosoted Pine Poles in Signal Service on the Big Four near Indianapolis, Ind.

International **Pressure Creosoted Yellow Pine Poles**

ACME

Varnished Insulations Electrically and Physically Tested*

for

DIELECTRIC STRENGTH
DIELECTRIC CONSTANT
DIELECTRIC LOSS
INSULATION RESISTANCE
POWER FACTOR
FLEXIBILITY
RESISTANCE TO TEAR
TENSILE STRENGTH
EFFECT OF HEAT
RESISTANCE TO OILS
RESISTANCE TO IMPREGNATING COMPOUNDS

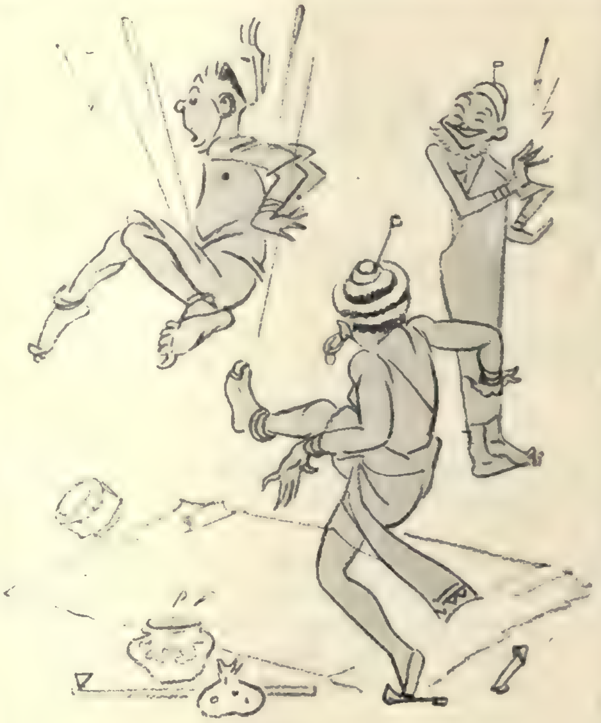
***A. S. T. M. Tests are followed in all Acme tests of raw materials and finished products.**

Acme Varnished Insulations are furnished in tape form to meet specifications. Furnished in widths of ¼-inch and wider; and in rolls of continuous lengths without splices up to 225 lineal yards. Special finishes furnished on order. Write for Catalog 3-J, telling the story of Acme Varnished Insulations.

ACME WIRE PRODUCTS

The Acme Wire Co.
Main Office and Plant, New Haven, Conn.

New York, 52 Vanderbilt Ave.
Boston, 80 Federal St.
Chicago, 427 West Erie St.
Cleveland, Guardian Bldg.



BUSS

The Burmese woman when she finds her husband uncongenial or undesirable, gives him the buss, or gate, by the simple expedient of going before the village elders and stating that the deal is all off.

Someone else may have made the choice, but she alone can break it off.

We'll bet that there are a good many operators who, reading this, will wish that they could as easily get rid of their uncongenial carbon brushes that someone else bought for them.

Perhaps more of them could do it if they would go before their elders and say: "We can't get Morganite bliss until we get rid of the ball-and-chain brushes you've tied to us."

Or in other words—ask the boss to give the buss to carbon brushes that raise a fuss.

Morganite Brush Co., Inc.

Main Office and Factory
3302-3320 Anable Ave., Long Island City, N. Y.

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JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

Barron G. Collier
INCORPORATED
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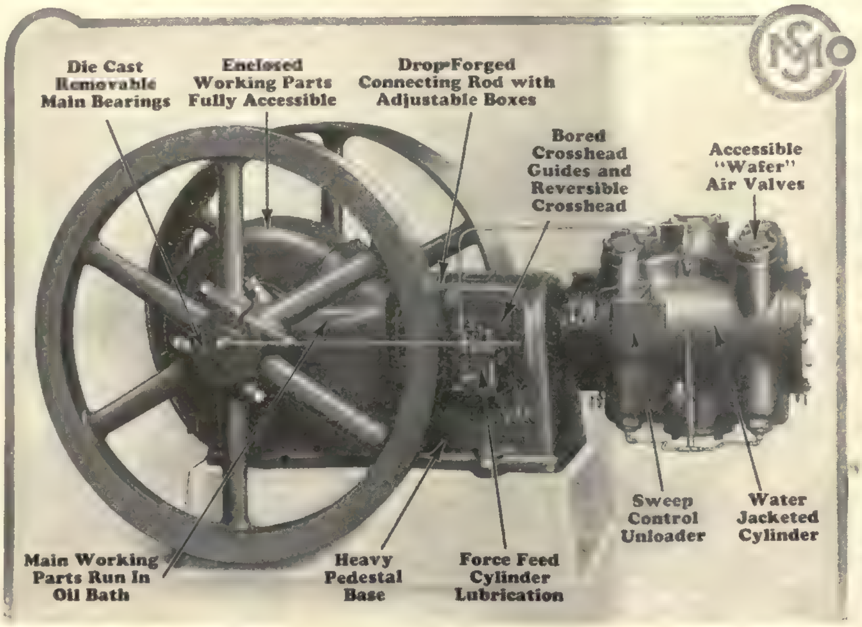
10 Reasons for Expecting Better Air Power Service


Die Cast Removable Main Bearings
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Accessible "Wafer" Air Valves
Sweep Control Unloader
Water Jacketed Cylinder
Main Working Parts Run In Oil Bath
Heavy Pedestal Base
Force Feed Cylinder Lubrication

EVERY feature shown at the left is a reason why the Sullivan "WG-6" compressor will give you dependable, economical air power. You will want to know more about this compressor.

No Dust — Sure Lubrication

Main working parts are enclosed in a dust-tight housing, and run in an oil bath. The cylinder is oiled by a reliable force-feed lubricator. Oil needs replenishing only at long intervals.

Wafer Valves

save power, and they are easy to get at and adjust.

"Sweep Control" Unloading Appliance

saves power by automatically interrupting compression whenever the desired pressure is reached; enabling the machine to run under no load until air is needed again.

There are other features, and while Sullivan compressors are distinctly power plant units, their importance in production necessitates some knowledge of them by the shop executive.

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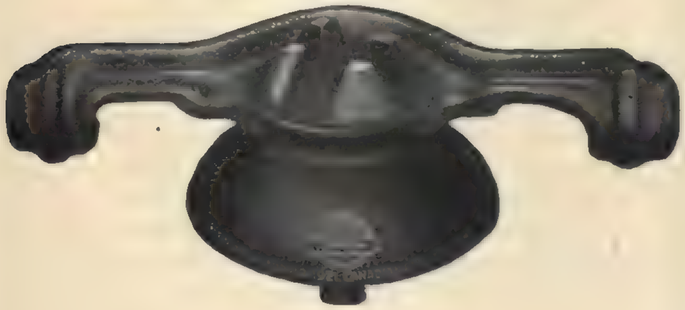

Drew Floating Bell Hanger (Left)

Positively eliminates loose ears because of tight lock between hanger and ear. Prevents rusted and worn threads. Assures better service with a saving.

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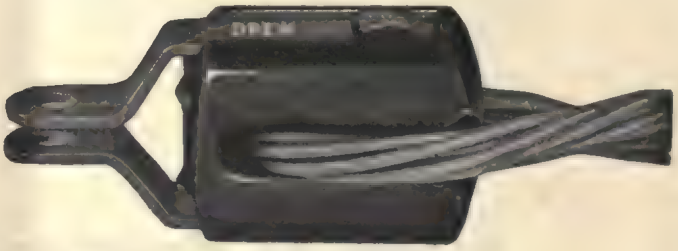

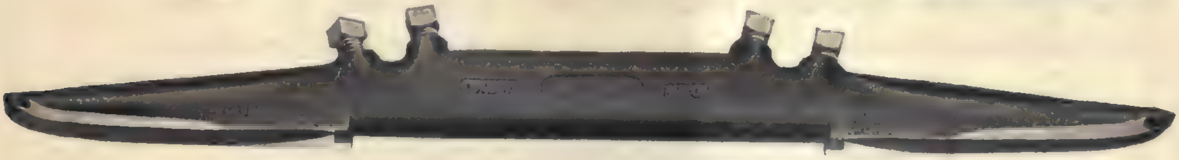

Type "L" (Heavyweight) or Type "R" (Lightweight) Splicing Ear or Splicer (Above)

Actually becomes a part of the wire in use, giving smooth under-run for the life of the wire. V-shaped approach carries the current collector on and off with minimum jar or vibration. Prevents notching or rough spots.

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Greatly reduces boarding and alighting accidents. Quickly adjustable for different types of cars. Gives motorman clear view of steps. Cuts running time because motorman can always be ready for instant starting.

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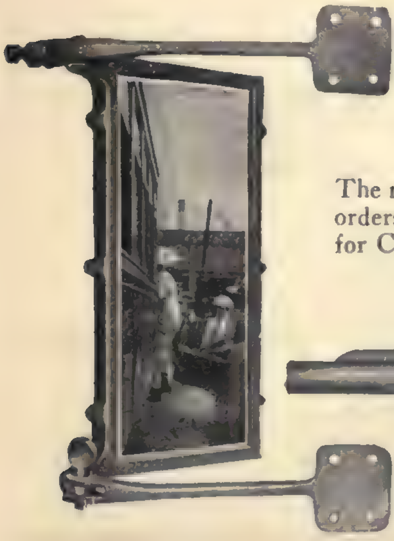
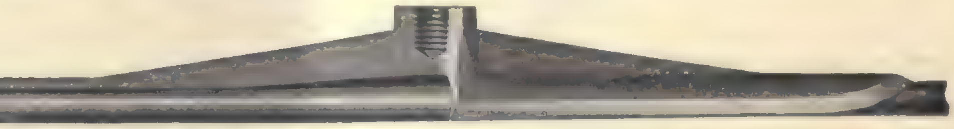
Does away with destructive wear on trolley. Eliminates pounding on trolley wheel, base, hangers, trough structure. Insures smoother and quieter car operation.



Drew Cushion Ear (Below)

The merit of this ear is best recognized from its performance in actual service. Repeat orders over a period of years from large and small properties prove the claims we make for Cushion Ears. Longer life and complete protection for the trolley wire.



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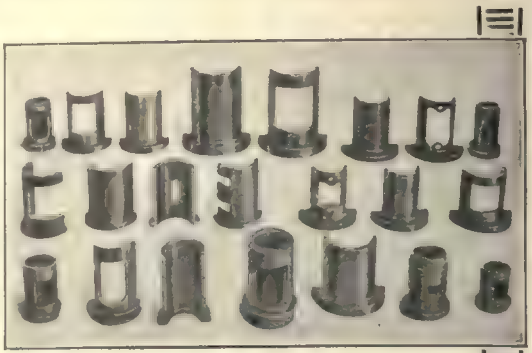
Cleveland, Ohio



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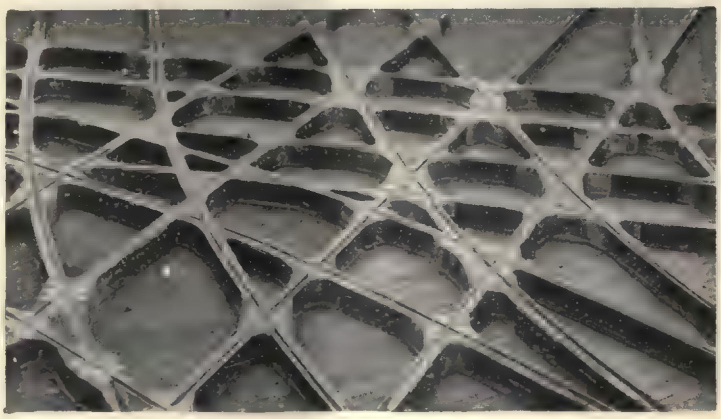

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A NUTTALL salesman walked into the office of the Master Mechanic of a large eastern railway. When the Master Mechanic saw the salesman he laughed.

"You can't sell me any gears," quoth the M. M.

"And, why not?" inquired the salesman.

Then the Master Mechanic took the salesman out into the shop and showed him some Nuttall BP gears that after ten years of service showed but .012 of an inch of wear.

"They'll outwear the car," said the Master Mechanic. "That's why you can't sell me any gears, we simply don't need 'em. But, believe me, Nuttall BP gears will go on all of our new equipment."

Send for our bulletin No. 52

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This 3-Section

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We'll gladly send you details.

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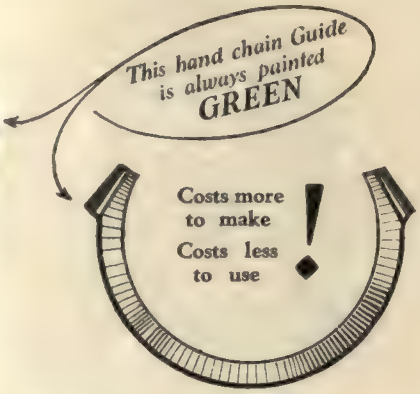
This hand chain Guide is always painted GREEN
Costs more to make
Costs less to use
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IT IS always painted GREEN for two reasons.

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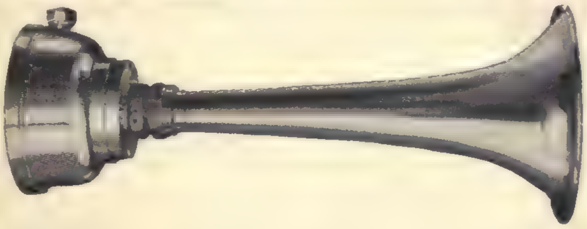

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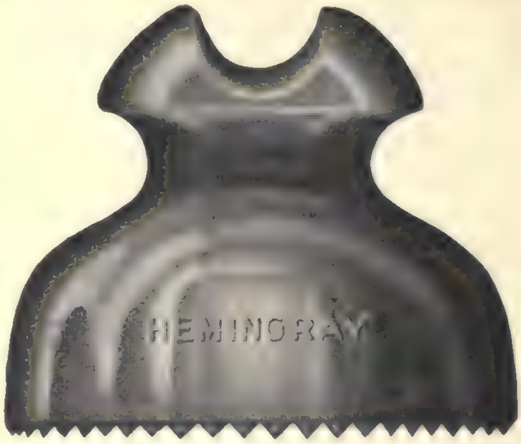

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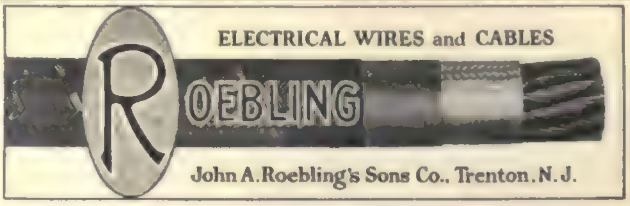

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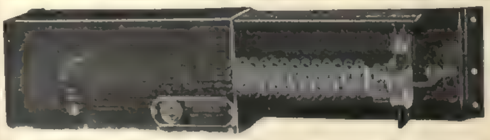

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G-20

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Ohio Brass Co.
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Appraisals
American Appraisal Co.

Armature Shop Tools
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.

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Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Cincinnati Car Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.

Babbitt Metal
More-Jones Brass & Metal Co.

Babbitting Devices
Columbia Machine Works & M. I. Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Batteries, Dry
Nichols-Lintern Co.

Bearings, Anti-Friction
Hyatt Roller Bearing Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Drew Elec. & Mfg. Co.
Eureka Copper Products Co.
General Electric Co.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Stucki Co., A.

Bearings, Roller
Hyatt Roller Bearing Co.

Bearings, Roller and Ball
S. K. F. Industries
Timken Roller-Bearing Co.

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
J. G. Brill Co.
Cummings Car & Coach Co.
Fitzjohn Mfg. Co.
St. Louis Car Co.

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Haskelite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

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Russell, Burdsall & Ward Co.

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American Steel & Wire Co.
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Amer. Steel & Wire Co.
Electric Ry. Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
American Steel & Wire Co.
Drew Elec. & Mfg. Co.
Electric Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Brackets, Fand Rail
Columbia Machine Works & M. I. Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)
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Bates Expanded Steel Truss Co.
Columbia Machine Works & M. I. Co.
Drew Elec. & Mfg. Co.
Electric Railway Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

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Brill Co., The J. G.
Cincinnati Car Co.
National Railway Appliance Co.
Westinghouse Traction Br. Co.

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Johns-Manville Corp.

Brake Shoes
American Brake Shoe & Foundry Co.
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Brill Co., The J. G.
St. Louis Car Co.

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Cincinnati Car Co.
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National Brake Co.
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Safety Car Devices Co.
Westinghouse Traction Brake Co.

Brakes, Magnetic Rail
Cincinnati Car Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
Eureka Copper Products Co
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co.
Westinghouse E. & M. Co.

Brushes, Graphite
Morganite Brush Co.

Brushholders
Columbia Machine Works & M. I. Co.
Eureka Copper Prod. Co.

Building Materials, Fireproof
Johns-Manville Corp.

Buildings, Steel
American Bridge Co.

Bulkheads
Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Bus Lighting
National Railway Appliance Co.

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Graham Bros.
International Motor Co.
Mack Trucks, Inc.
Yellow Truck & Coach Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.

Cables (See Wires and Cables)

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Irvington Varnish & Ins. Co.
Mica Insulator Co.

Carbon Brushes (See Brushes, Carbon)

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Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.
Irving Iron Works

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.

Cars, Passenger, Freight, Express, etc.
Amer. Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Drew Elec. & Mfg. Co.
Eureka Copper Prod. Co.
More-Jones Brass & Metal Co.

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American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Standard Steel Works Co.
Wm. Wharton, Jr. & Co., Inc.

Castings, Malleable & Brass
Bemis Car Truck Co
Columbia Machine Works & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
Earll, C. I.
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

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Haskelite Mfg. Corp.

Ceilings, Plywood Panels
Haskelite Mfg. Corp.

Cement Products
Portland Cement Assn. Co.

Change Carriers
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Electric Service Supplies Co.

Change Trays
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Westinghouse E. & M. Co.

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Electric Ry. Improvement Co.
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General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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Oakite Products, Inc.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)
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Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.

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General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
Columbia Machine Works & M. I. Co.
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General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
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General Electric Co.
Westinghouse E. & M. Co.

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Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

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General Electric Co.
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Johns-Manville Corp.

Compressors, Air
General Electric Co.
Sullivan Machinery Co.
Westinghouse Traction Br. Co.

Compressors, Air, Portable
Sullivan Machinery Co.

Compressors, Gas
Sullivan Machinery Co.

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Westinghouse E. & M. Co.

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Conduits, Fibre
Fibre Conduit Co.

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Dossert & Co.
Westinghouse E. & M. Co.

Connectors, Trailer Car
Columbia Machine Works & M. I. Co.
Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
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General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

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General Electric Co.
Westinghouse E. & M. Co.

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General Electric Co.
Westinghouse E. & M. Co.

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American Steel & Wire Co.
Brill Co., The J. G.
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Roebling's Sons Co., J. A.
St. Louis Car Co.
Samson Cordage Works

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Elec. Service Supplies Co.
Samson Cordage Works
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American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.
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Nichols-Lintern Co.

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Lang Body Co.
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Electric Service Supplies Co.

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Wish-Service, P. Edward

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Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co., Inc.
Safety Car Devices Co.

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Cincinnati Car Co.
General Electric Co.
Hale-Kilburn Co.
St. Louis Car Co.

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National Pneumatic Co., Inc.
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Drills, Track
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Railway Trackwork Co.

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Railway Trackwork Co.
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Bibbins, Rowland J.
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Jackson, Walter
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Wood Co., Chas. N.

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(Continued on page 74)

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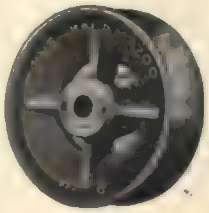

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Lorain Special Trackwork
Girder Rails

Electrically Welded Joints

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We make a specialty of
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LUBRICATION
We solicit a test of TULC
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Nuttall Co., R. D.
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General Electric Co
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Grating, Steel Subway
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Nichols-Lintern Co.
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Haskelite Mfg. Corp
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Ramapo Ajax Corp.
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Manganese Steel Switches, Frogs and Crossings
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Westinghouse E. & M Co.
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Brill Co., The J. G.
Cincinnati Car Co.
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Bemis Car Truck Co.
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Oils (See Lubricants)
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(Continued on Page 76)

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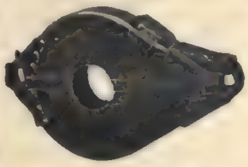

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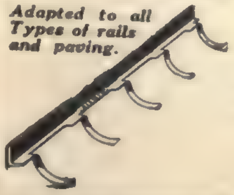

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ALPHABETICAL INDEX TO ADVERTISERS

	Page
Acme Wire Co., The	58
American Appraisal Co., The	66
American Brass Co., The	75
American Bridge Co	70
American Car Co	77
American Electrical Works	70
American Insulating Mach. Co.	69
American Spiral Spring & Mfg. Co.	Insert 1094B
American Steel & Wire Co	53
American Steel Foundries	6
American Strombos Co., The	67
Anaconda Copper Mining Co	75
Archbold-Brady Co	69
Babcock & Wilcox Co	69
Bates Exp. Steel Truss Co	70
Beeler Organization, The	68
Bemis Car Truck Co	75
Bethlehem Steel Co	45
Bibbins, J. Rowland	69
Bridgeport Brass Co	26
Brill Co., The J. G	77
Buchanan & Layng Corporation	68
Buda Co., The	62
Cameron Electric Mfg. Co	75
Carnegie Steel Co	65
Chillingworth Mfg. Co	75
Cincinnati Car Co	16
Clark-Williams Engineering Co.,	Insert 1094B
Cleveland Fare Box Co., The	66
Collier, Inc., Barron G	59
Columbia Machine Works & M. I. Co., The	62
Consolidated Car Fender Co., The	75
Consolidated Car Heating Co	48
Cummings Car & Coach Co	20
Day & Zimmermann, Inc	68
Dayton Mechanical Tie Co., The	Insert 43-44
DeLaval Separator Co., The	54
Differential Steel Car Co., The	70
Dossert & Co	64
Drew Electric & Mfg. Co	61
Drum & Co., A. L	68
Earll, C. I	67
Economy Electric Devices Co	17
Electric Equipment Co	71
Electric Railway Equipment Co.	63
Electric Railway Improvement Co.	55
Electric Service Supplies Co	7
Eureka Copper Products, Inc	65
Faile & Co., E. H	68
Fisk Tire Co., Inc., The	32-33
Fitzjohn Mfg. Co	27
Ford, Bacon & Davis, Inc	68
Ford Chain Block Co	64
"For Sale" Ads	71
General Electric Co.,	21-22-Back Cover
General Tire & Rubber Co., The.	37
Globe Ticket Co	34
Godwin Co., Inc., W. S	75
Gold Car Heating & Ltg. Co	70
Graham Brothers	28-29
Griffin Wheel Co	66
Hale-Kilburn Co	47
Haskelite Mfg. Corp.	Insert 1094B
"Help Wanted" Ads	71
Hemingray Glass Co	67
Hemphill & Wells	68
Holst, Englehardt W	68
Hubbard & Co	75
Hyatt Roller Bearing Co	41
International Creosoting & Construction Co	57
International Motor Co.,	Insert 11-12-13-14
International Oxygen Co	69
India Tire & Rubber Co	30
International Register Co	73
International Steel Tie Co.,	Front Cover
Irving Iron Works Co	50
Irvington Varnish & Insulator Co.	73
Jackson, Walter	68
Jeandron, W. J	64
Kelly-Springfield Tire Co	40
Kelker, DeLeuw & Co	69
Kuhlman Car Co	77
Lang Body Co	71
Le Carbone Co	64
Linn & Marshall, Inc	68
Lorain Steel Co., The	73
Mack Trucks Inc.	Insert 11-12-13-14
McCardell Co., J. R	64
McClellan & Junkersfeld	68
McGraw-Hill Publishing Co., Inc.,	38-39
Metal & Thermit Corp	49
Mica Insulator Co	65
More-Jones Brass & Metal Co.	66
Morganite Brush Co	58
Nachod and United States Signal Co., Inc	67
National Brake Co., Inc	23
National Pneumatic Co	15
National Railway Appliance Co.	69
Naugle Pole & Tie Co	75
Nichols-Lintern Co., The	73
Nuttall Co., R. D	63
Oakite Products, Inc	66
Ohio Brass Co	5
Okonite-Callender Cable Co., Inc., The	75
Okonite Co., The	75
Perey Mfg. Co., Inc	75
Portland Cement Association	52
Positions Wanted and Vacant	7
Railway Track-work Co	4
Railway Utility Co	70
Ramapo-Ajax Corp	75
Richey, Albert S	68
Roebling's Sons Co., John A	69
Russell-Burdsall & Ward Bolt & Nut Co.	35
S.K.F. Industries, Inc	36
St. Louis Car Co	8-9
Safety Car Devices Co	18
Samson Cordage Works	75
Sanderson & Porter	68
Schullen Steel Co	71
Searchlight Section	71
Smith Heater Co., Peter	75
Standard Oil Co	46
Standard Steel Works Co	42
Star Brass Works	73
Stevens & Wood, Inc	68
Stone & Webster	68
Stucki Co., A	69
Sullivan Machinery Co	60
Texas Co., The	51
Tool-Steel Gear & Pinion Co.,	Insert 1094A
Una Welding & Bonding Co	69
United States Rubber Co	19
Universal Lubricating Co	73
"Want" Ads	71
Wason Mfg. Co.	77
Waukesha Motor Co	31
Westinghouse Electric & Mfg. Co.	2
Westinghouse Traction Brake Co.	10
Wharton, Jr. & Co., Wm	76
"What and Where to Buy"	72-74-76
White Engineering Corp., J. G.	68
Wish Service, The P. Edw	69
Wood Co., Chas. N	70
Yellow Truck & Coach Mfg. Co.,	24-25

WHAT AND WHERE TO BUY—Continued from Page 74

- **Stokers, Mechanical**
  - Babcock & Wilcox Co.
  - Westinghouse E. & M. Co.
- **Stop Signals**
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- **Ties, Wood Cross (See Poles, Ties, Posts, etc.)**
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  - Goodyear Tire & Rubber Co.
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  - Kelly-Springfield Tire Co.
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  - St. Louis Car Co.
- **Transfers (See Tickets)**
- **Transfer Tables**
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  - Electric Service Sup. Co.
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- **Trolley Shoe**
  - Miller Trolley Shoe Co.
- **Trolley Wheel Bushings**
  - More-Jones Brass & Metal Co.
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- **Trolley Wheels (See Wheels, Trolley)**
- **Trolley Wire**
  - American Brass Co.
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  - Ohio Brass Co.
  - Railway Trackwork Co.
  - Una Welding & Bonding Co
  - Westinghouse E. & M. Co.
- **Welding Steel**
  - Electric Ry. Improvement Co.
  - Railway Trackwork Co.
  - Una Welding & Bonding Co.
- **Welding Wire**
  - American Steel & Wire Co.
  - General Electric Co.
  - Railway Trackwork Co.
  - Roebling's Sons Co., J. A.
- **Welding Wire and Rods**
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- **Wheel Guards (See Fenders and Wheel Guards)**
- **Wheel Presses (See Machine Tools)**
- **Wheels, Car, Cast Iron**
  - Griffin Wheel Co.
- **Wheels, Car Steel & Steel Tire**
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  - Bemis Car Truck Co.
  - Carnegie Steel Co
  - Standard Steel Works Co.
- **Wheels, Trolley**
  - Columbia Machine Works & M. I. Co.
  - Electric Railway Equipment Co.
  - Electric Service Supplies Co.
  - Eureka Copper Prod. Co.
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  - Nuttall Co., R. D.
  - Star Brass Works
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  - Carnegie Steel Co.
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  - Westinghouse Traction Brake Co.
- **Window Guards & Fittings**
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- **Wires and Cables**
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  - Okonite-Callender Cable Co.
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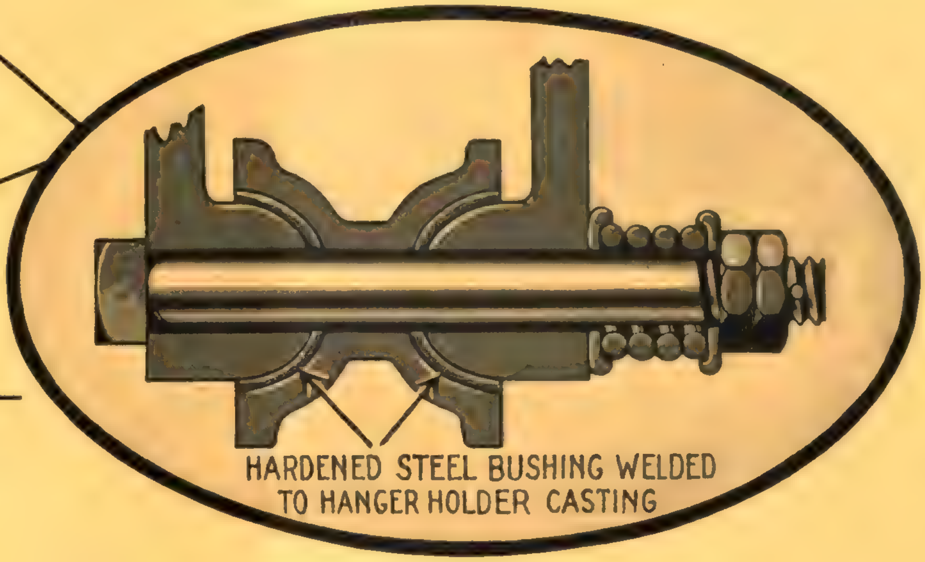
  - Westinghouse E. & M. Co.

Improvement—always the trend of Brill Truck Design



Brill Half-Ball Brake Hanger

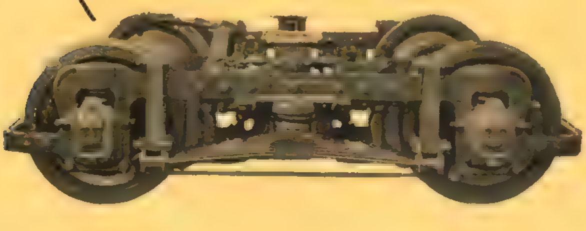
The various types of Brill trucks for single or double truck cars, for both city and interurban service, represent the result of years of successful development.

Smooth and comfortable riding action, long life, minimum maintenance and general all-round efficiency have been the objective toward which Brill engineers have always directed their efforts.

The use of hardened steel bushings welded to sockets of Half-Ball hanger castings, instead of scrapping the entire part due to wear, is another step in the direction of reduced maintenance.

Also standard equipment on

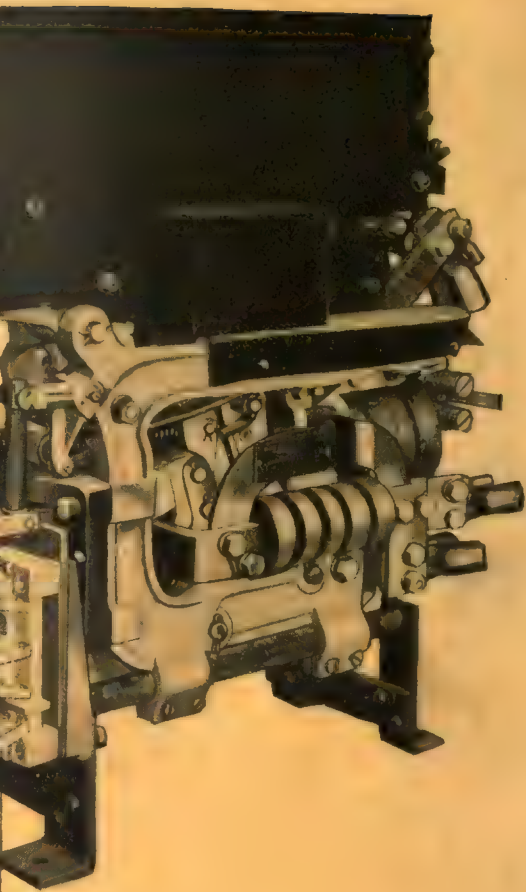
Brill 177-E Trucks

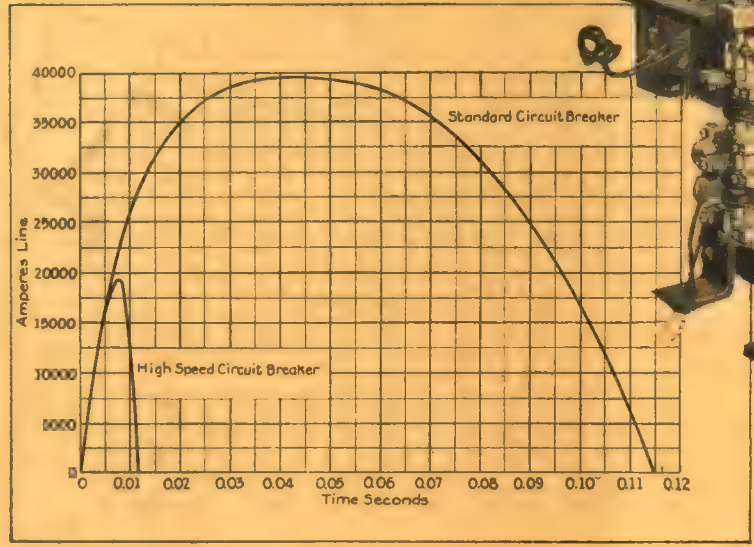


THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

"Recommended by Proven Merit"

The G-E High-Speed Circuit Breaker





—and the measure of its greater protection

Even a hasty glance at these two curves impresses one with the extremely high speed and the effectiveness of this breaker for limiting short-circuit currents. G-E high-speed Breakers have been giving ideal protection in hundreds of installations since 1917.

This type of circuit breaker has been uniformly successful in protecting substation apparatus, substation feeders, and electric locomotives. The reduction in current and flashing that results from its use greatly decreases wear of commutator and brushes and practically eliminates damage from internal grounding. It also insures greater reliability and lower substation maintenance.

3-14

GENERAL ELECTRIC

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ELECTRIC RAILWAY JOURNAL

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Collier Service has been a reliable source of income to operating companies throughout the nation for a period of many years.

Long experience has established the basis on which car card advertising must be conducted in order to sustain this source of income.

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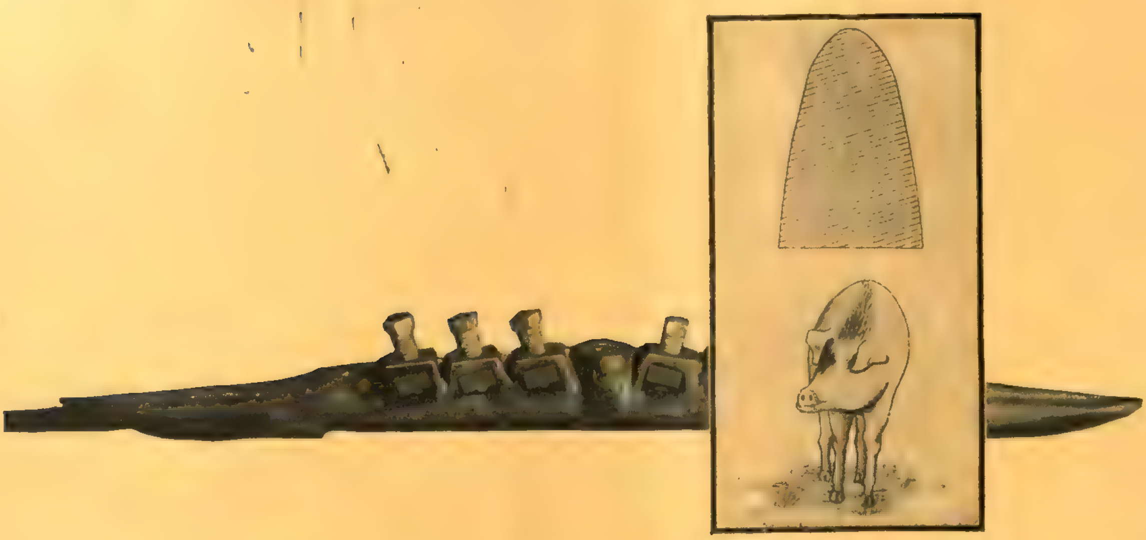

Razor Back

The RB Trolley Splicer

THIS new Westinghouse splicer has an under-run shaped like a razor-back hog—hence its name, RB.

Because of its tapered shape, coming to a rounded point at the bottom, the RB splicer rides on the bottom of the groove in the trolley wheel. Wear is almost entirely confined to rolling friction. Of grinding friction where the splicer rubs against the side of the wheel there is very little on tangent track.

Burning also is reduced—by the smooth under-run that is almost as smooth as plain wire. The complete transition takes place on a straight line.

The RB splicer is easy to install. Wires are inserted without bending. A pair of pliers is sufficient to tighten the set screws with rocking nuts. And how those rocking nuts do hold! Increased tension on the wire just makes them hang on tighter.

Keep Your
Overhead *Down*
by
Keeping it UP
with
Westinghouse
Rocking Nuts

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

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Vol. 69
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CONTENTS

JUNE 25, 1927

Editorials 1125

Railways Can Take Lead in Reducing Traffic Congestion 1128

By L. M. Traiser.

Reduction in cost of operation, increase in revenue and a better position in the community await leadership by electric railways. Intimate knowledge of the present situation qualifies railway operators to aid solution of baffling community problem.

German Road Makes Progress 1131

By W. Cauer.

Proposed Rhenish-Westphalian high-speed line will have approximate length of 115 miles. The main line will serve nine cities and several branches are proposed.

Co-ordination in Portsmouth, Ohio 1133

Modern cars and buses have increased the total revenue of the Portsmouth Public Service Company in the face of automobile and independent bus competition.

Buses Operated in Feeder Service 1135

Municipal Railway of San Francisco is using buses to augment rail lines in several districts where extension of tracks would not be justified.

Railway Operates Auxiliary Fire Apparatus 1137

Car Rebuilt to Resemble Motor Coach 1138

Operating Efficiency Raised Through the Merit System 1139

Systematic administration of discipline, coupled with awards for good records and further bonuses for especially meritorious service has proved popular with management and men in Los Angeles.

Carpenter Shop Waste Disposal Plant 1144

Alarm Clocks for Patrons 1144

The Readers' Forum 1145

Windshields Kept Free of Frost 1145

Maintenance Notes 1146

Association News and Discussion 1149

Field of the Motor Bus 1149

By A. J. Brosseau.

American Association News 1150

News of the Industry 1151

Recent Bus Developments 1155

Financial and Corporate 1156

Personal Mention 1161

Manufactures and the Markets 1163

Even Across the Seas

IN A RECENT morning's mail ELECTRIC RAILWAY JOURNAL received subscriptions from the citizens of four foreign nations. Theirs was a delicate compliment both to our contributors and the publisher. Aside from revealing a breadth of circulation, the interest of these European subscribers who buy the JOURNAL unsolicited indicates the effectiveness of its publishing policy—in short, that the subject matter of every article should contain some element of general significance, some helpful thought or suggestions by which the industry as a whole may profit.

Those who serve the public have no country. There are no barriers to the common purpose of their efforts. As public servants they must draw from every source of inspiration if their achievements are to reach the highest plane. With this spirit, therefore, the JOURNAL welcomes its new subscribers from Vienna, Leningrad, Moscow, Berlin and Bologna. May its pages afford them a stimulus for greater activity and service in their chosen field, and make them conscious that their brothers across the seas consider them as seated around a great council table.

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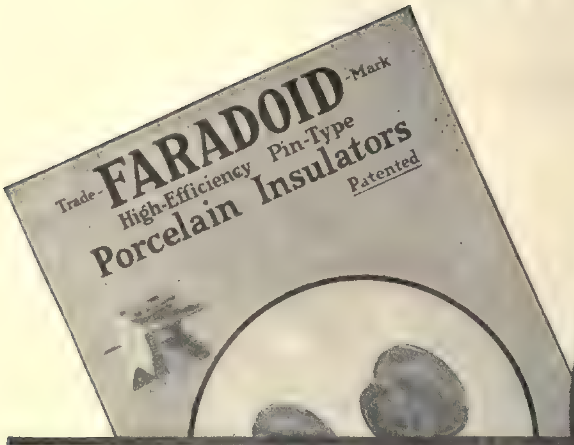


Trade-FARADOID-Mark
High-Efficiency Pin-Type
Porcelain Insulators
Patented

Introduced–
Nine Years Ago

Today

The Accepted Type

Porcelain
you can install
–and forget

- because science—not tradition—governs the making of all Westinghouse porcelain and insulators.
- precision processes, at every stage, are the rule.
- never is anything taken for granted at any time.
- even slight variations in materials are compensated for.

First the design—then the materials—then the method—and then, a vigilance that permits no compromise.

ALMOST a decade ago, Westinghouse engineers departed from the then accepted types of insulators and developed a new insulator. It was based on an accepted scientific principle—the principle of the electrostatic field evolved by Faraday.

In the years that followed, minor changes were made—developing a theoretically perfect design into a workable, serviceable insulator. But the fundamental principle was not changed, and today it is recognized as the logical basis for multi-part insulator design.

The Faradoid is the Westinghouse pin-type insulator whose design is based on the principle discovered by Faraday.

Westinghouse Electric & Manufacturing Company
Westinghouse High-Voltage Insulator Works
Derry, Pa. Emeryville, Cal.
Sales Offices in All Principal Cities of
the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION 1927

Westinghouse
X91113

Improved O-B Trolley Wheel and Harp (Feist patents) for city service. Furnished with "U" or "V" Groove in 5 and 6-in. sizes.

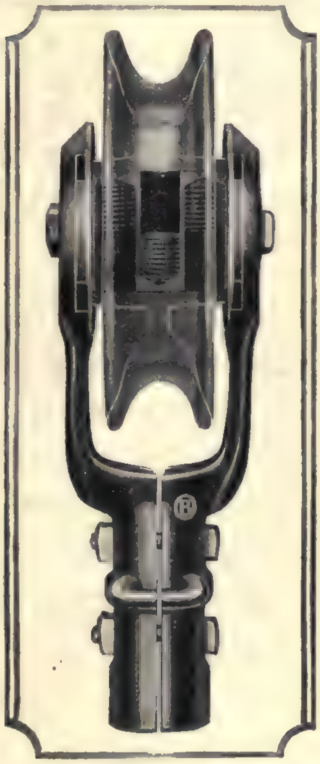
Just How Costly Are Old Style Trolley Wheels?

RECENT investigations show that, including maintenance, inspections and replacements, the *average* cost for Old Style Trolley Wheels is 29.8 cents per 1,000 car miles. Some properties estimate that Old Style Trolley Wheels cost no less than 74 cents per 1000 car miles!

These figures do not include such intangible costs as, for instance, excessive wear on the overhead due to "chattering" and arcing wheels; damage to the car roof due to dripping oil; pull-ins, line breaks, and delayed schedules due to badly worn wheels.

When the *total cost per year* of Old Style Trolley Wheels is considered, is it any wonder that electric railways are welcoming the new and *Improved* O-B Trolley Wheel which costs only 19 cents average per 1,000 car miles; that needs no inspections, oiling, or maintenance from the day it is put in service; that averages 15,000 or more miles and runs as smoothly for the last thousand miles as the first, without "chattering", and with the minimum of arcing and wear on the overhead?

Electric railways that measure progress in terms of cost reduction and more efficient operation will be satisfied with nothing less than the *Improved* O-B Trolley Wheel and Harp (Feist patents) after a comparison with present trolley wheel costs and service. For an analysis of Old Style Trolley Wheel costs and complete information on the *Improved* O-B Trolley Wheel and Harp, address



Phantom view showing fully automatic graphite lubricating plugs used in Improved O-B Trolley Wheel and Harp.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
420C

Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

REAL WHEEL STEEL

A WHEEL can be no better than the material of which it is made.

Davis "One-Wear" Steel Wheels are made of Real Wheel Steel.

It contains elements that when heat-treated produce physical characteristics that make the "One-Wear" idea practical.

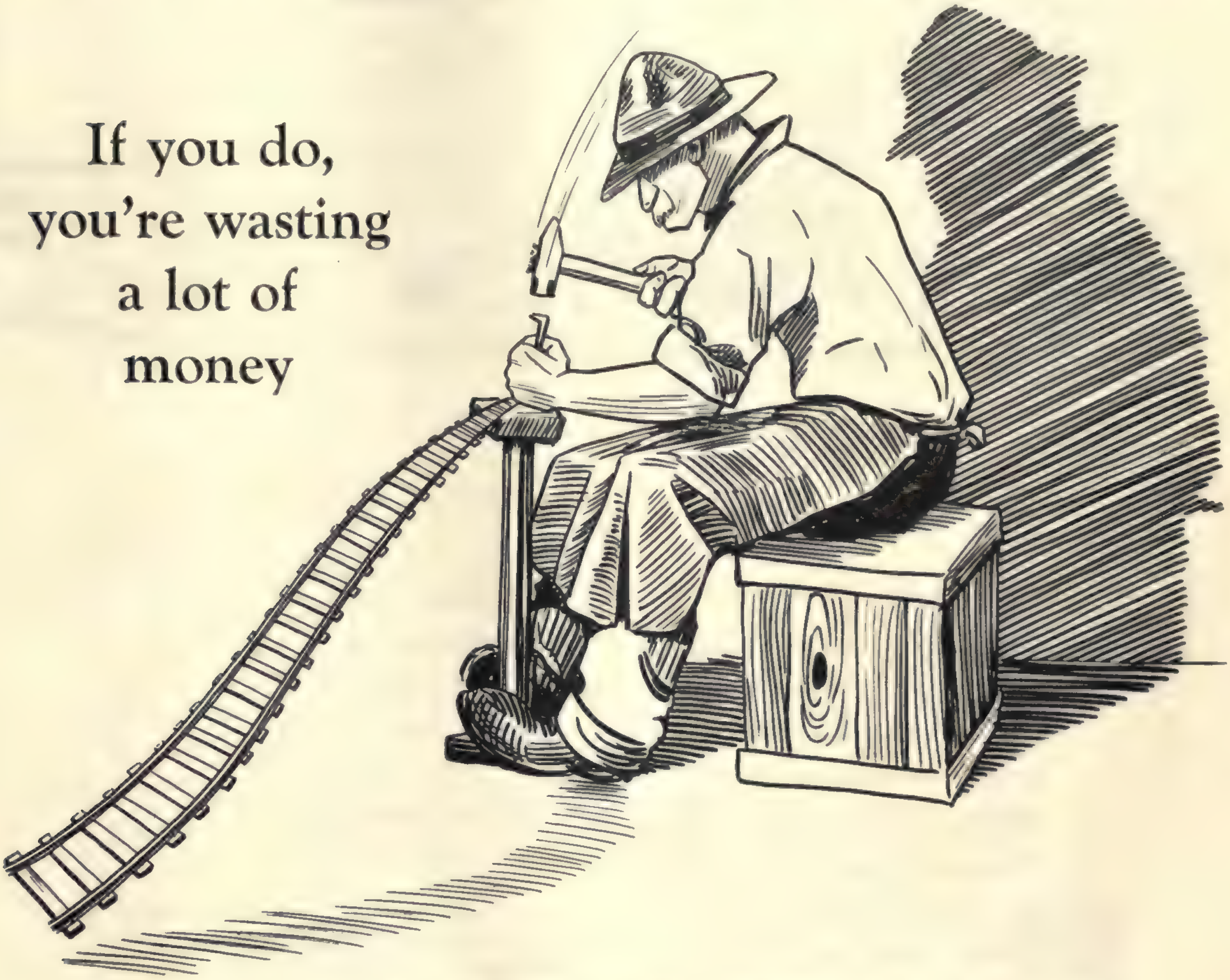
IT IS A REAL "ONE-WEAR" WHEEL METAL

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

Do you half-sole your track?

If you do,
you're wasting
a lot of
money



It's better to put down a foundation that will *out-wear* the rail—than to experiment with ties and foundations that break up, warping rails and demanding constant maintenance and replacement.

Steel Twin Ties, in concrete, will out-wear the rails. When the rail head wears down new rails can be laid on the old foundation. No more half-soling, you've got a permanent lasting foundation.

And the remarkable part of it all is that Twin Ties have cost less to install, and less over a period of years on hundreds of installations throughout the country.

Quick deliveries now for work that is in a hurry.

The International Steel Tie Co.
Cleveland, Ohio

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track

LAST WEEK

There goes high operating cost and poor public relations

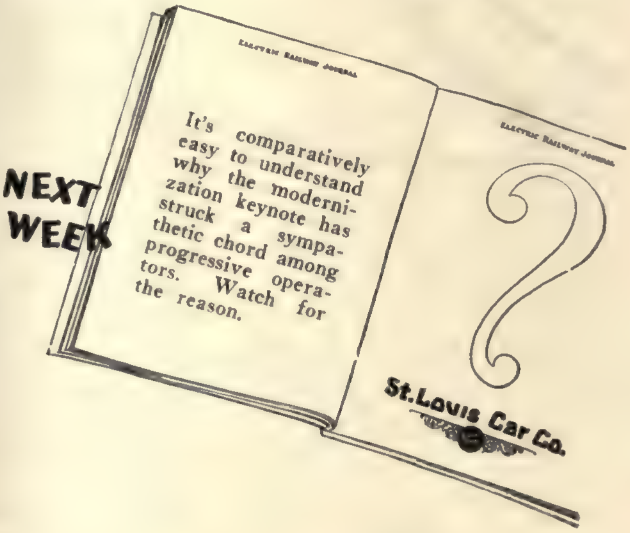
Turn such obvious losses into profits— with new equipment

St. Louis Car Co.

Quality Cars

In the light of PRESENT DAY knowledge and experience the advantages of the modern equipment have become obvious. Heavy, uneconomical and unattractive cars must be relegated to the scrap pile. They are mill stones that crush out profits and block progress. The only policy safe to follow today is that indicated by the cost sheets of modernized properties.

St. Louis Car Company stands ready to help you.



NEXT WEEK

ELECTRIC RAILWAY JOURNAL

It's comparatively easy to understand why the modernization keynote has struck a sympathetic chord among progressive operators. Watch for the reason.

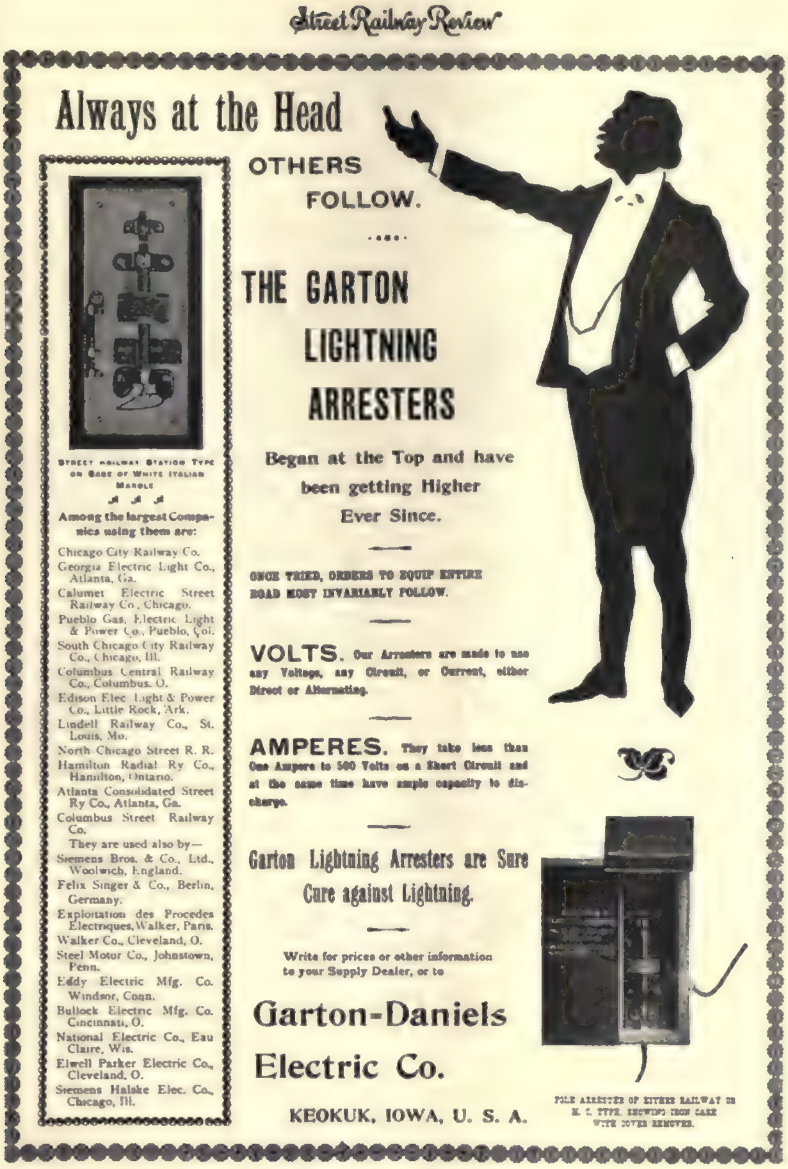
ELECTRIC RAILWAY JOURNAL

?

St. Louis Car Co.

St. Louis Car Co.

Quality Cars



Street Railway Review

Always at the Head

OTHERS
FOLLOW.

THE GARTON LIGHTNING ARRESTERS

STREET RAILWAY STATION TYPE ON BASE OF WHITE ITALIAN MARBLE

Among the largest Companies using them are:

- Chicago City Railway Co.
- Georgia Electric Light Co., Atlanta, Ga.
- Calumet Electric Street Railway Co., Chicago.
- Pueblo Gas, Electric Light & Power Co., Pueblo, Col.
- South Chicago City Railway Co., Chicago, Ill.
- Columbus Central Railway Co., Columbus. O.
- Edison Elec. Light & Power Co., Little Rock, Ark.
- Lindell Railway Co., St. Louis, Mo.
- North Chicago Street R. R.
- Hamilton Radial Ry Co., Hamilton, Ontario.
- Atlanta Consolidated Street Ry Co., Atlanta, Ga.
- Columbus Street Railway Co.

They are used also by—

- Siemens Bros. & Co., Ltd., Woolwich, England.
- Felix Singer & Co., Berlin, Germany.
- Exploitation des Procedes Electriques, Walker, Paris.
- Walker Co., Cleveland, O.
- Steel Motor Co., Johnstown, Penn.
- Eddy Electric Mfg. Co. Windsor, Conn.
- Bullock Electric Mfg. Co. Cincinnati, O.
- National Electric Co., Eau Claire, Wis.
- Elwell Parker Electric Co., Cleveland, O.
- Siemens Halske Elec. Co., Chicago, Ill.

Began at the Top and have been getting Higher Ever Since.

ONCE TRIED, ORDERS TO EQUIP ENTIRE ROAD MOST INVARIABLY FOLLOW.

VOLTS. Our Arresters are made to use any Voltage, any Circuit, or Current, either Direct or Alternating.

AMPERES. They take less than One Ampere to 500 Volts on a Short Circuit and at the same time have ample capacity to discharge.

Garton Lightning Arresters are Sure Cure against Lightning.

Write for prices or other information to your Supply Dealer, or to

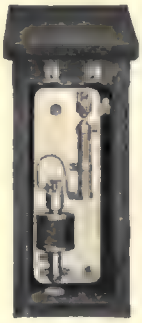
Garton-Daniels Electric Co.

KEOKUK, IOWA, U. S. A.

POLE ARRESTER OF EITHER RAILWAY OR A. C. TYPE, SHOWING IRON CASE WITH COVER REMOVED.

30 years ago—

An ad published almost 30 years ago in the Street Railway Review (later the Electric Railway Journal) stated rather immodestly that the Garton-Daniels Lightning Arrester was "always at the head—others follow." It is significant that after thirty years the direct current types of the Garton-Daniels Arresters remain unchanged in principle and are to-day the most widely used lightning arresters for the protection of electric railway circuits.



Present type of 600 volt Direct Current Arrester

N.B. Some years ago the Garton-Daniels Electric Company was consolidated with the Electric Service Supplies Company.

ELECTRIC SERVICE SUPPLIES COMPANY, PHILADELPHIA, 17th & Cambria Sts.; NEW YORK, 50 Church St.; CHICAGO, Ill., Merchants Bank Bldg.; Pittsburgh, Bessemer Bldg.; Boston, 88 Broad St.; Detroit, General Motors Bldg.; Scranton, 316 N. Washington Ave.; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

Can your cars "hold their own"?

City streets have become so crowded that there is constant competition between the various elements of traffic for the right of way.

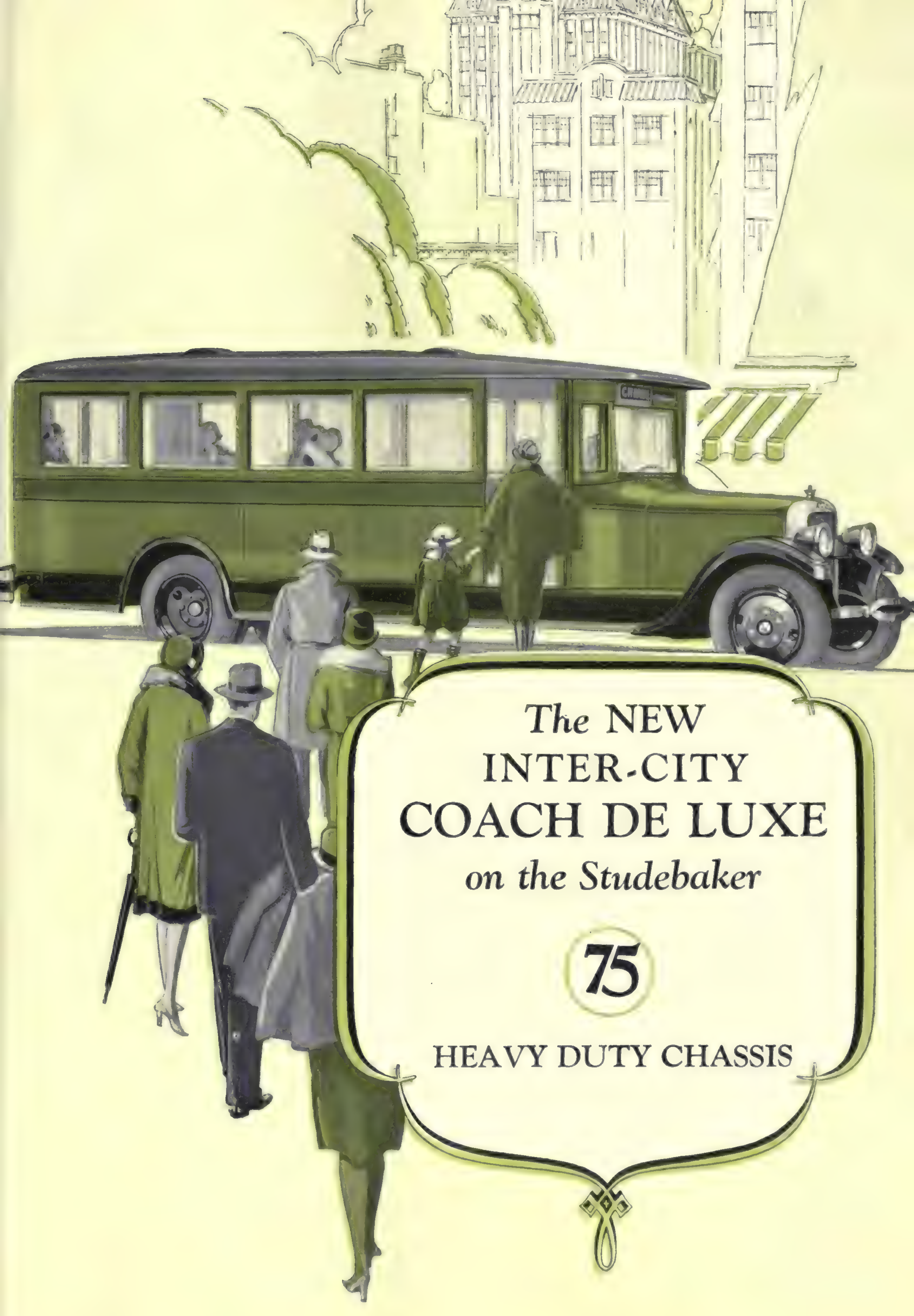
If street cars are to meet this condition and hold their own in the general traffic movement they must be as mobile as other conveyances that use the streets.

An effective means of increasing car mobility is to provide brakes that will permit short stops, and the consequent longer period of peak speed operation and shorter running time between stops. With ordinary brakes, however, the retarding force which is satisfactory for the empty car is less effective when the car is loaded, so that the stopping distance lengthens, and this usually happens just when other vehicles are also contending for the right of way.

The Westinghouse Variable Load Brake was designed to correct this condition. It automatically adjusts the retarding force as the weight varies, so that the stopping distance is constant throughout the range of car loading. This results in accelerated transportation service just when the greatest possible hauling capacity is needed most.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES



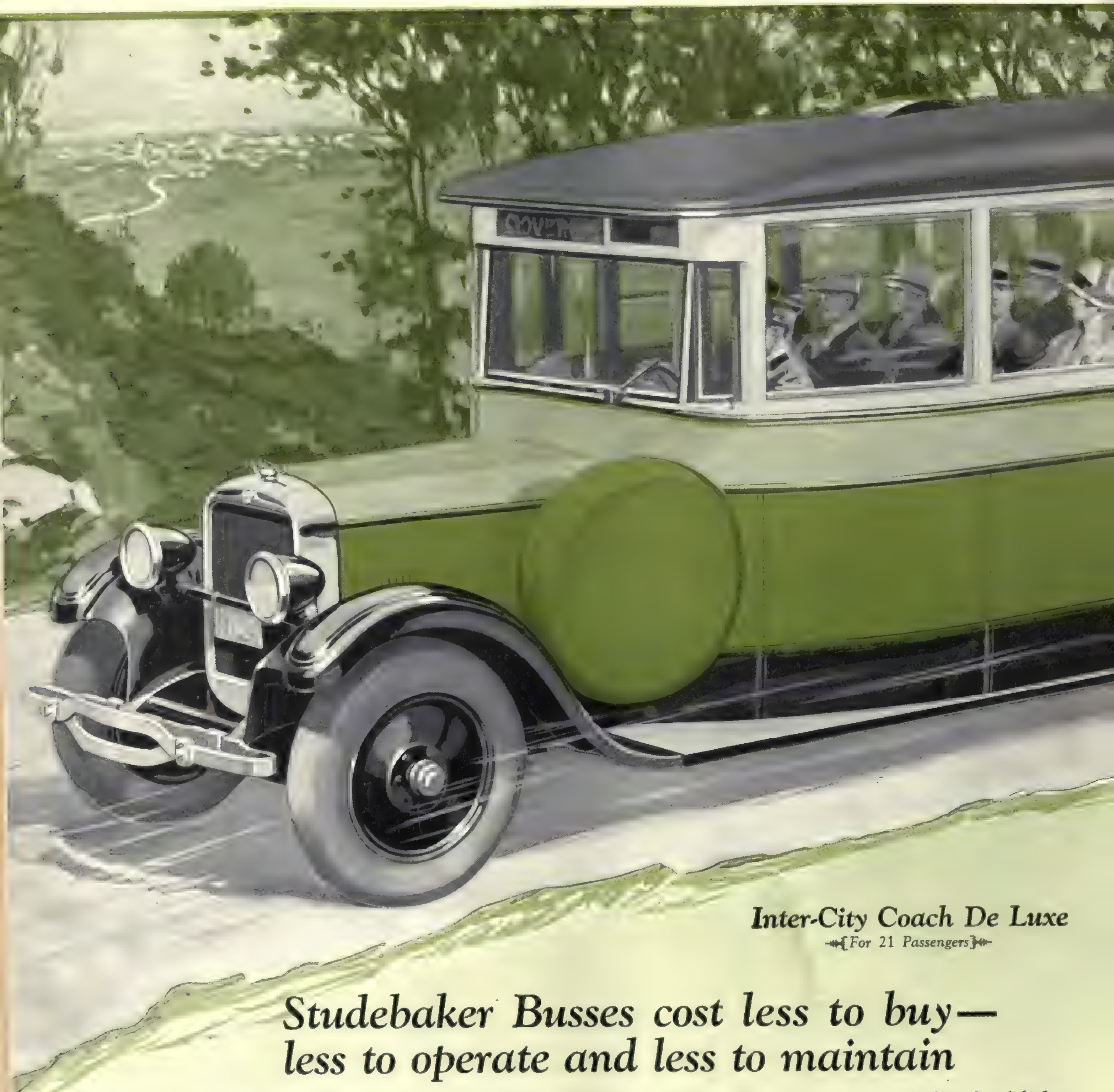
The NEW INTER-CITY COACH DE LUXE

on the Studebaker

75

HEAVY DUTY CHASSIS

You Make More Money



Inter-City Coach De Luxe
For 21 Passengers

Studebaker Busses cost less to buy—less to operate and less to maintain

ASK any Studebaker bus operator why he bought Studebakers and he will tell you that Studebaker busses give greater profits with less invested capital. For instance, Chas. F. Egli, manager of the White Star Line, Washington, Pa., operating 17 Studebaker busses and 4 truck-type busses says: "The 5 new Studebaker parlor cars recently added to our fleet were purchased because we have demonstrated that Studebaker equipment costs considerably less to operate and maintain and the initial cost is most attractive. The splendid appearance of our Studebakers attracts new patronage while their dependability permits us to operate our line on a definite schedule and comfortable riding qualities hold the good will of the riding public."

The New Studebaker 75

with Studebaker Equipment

The Convenience *of a* City Bus *with* Parlor Car Luxury

OPERATORS covering routes which pass through or join medium-size cities must necessarily give a combination city and inter-city service. Studebaker has anticipated the needs of inter-city bus operators and offers in the new Studebaker Inter-City Coach DeLuxe a unit which contains many features that are far in advance of the current practice in bus design. In reality it is a new type of vehicle of marked beauty possessing city bus convenience and parlor car luxury.

Superlative Comfort

For city service this De Luxe Coach meets present day traffic problems by providing an exclusive conveyance which will appeal to the better class of riders who are not interested in the ordinary truck-type bus. On inter-city routes it wins public preference because of the superlative comfort of the luxurious leather lounging seats spaced to provide ample leg room. Its extra large windows give uninterrupted vision; the spacious interior gives a greater sense of roominess than is found in the ordinary parlor coach.

Speed with Safety

Because of its abundant power and effortless steering, it is as easy to drive this coach as it is to drive an ordinary passenger car. According to the Society of Automotive Engineers' rating it has the most powerful bus chassis of its size and weight in the world. Loaded to capacity this coach glides quietly along the highway at permitted speeds with a smoothness alone attainable by a perfectly balanced mechanism and a power plant which is practically vibrationless. Smooth-acting four-wheel mechanical brakes of the self-energizing type enable the driver to safely negotiate heavy city traffic or ease around sharp curves with perfect safety. While traveling at 40 miles per hour this coach can be stopped in 71 feet, or in twice its own length at 20 miles per hour.

Heavy Duty Bus Chassis

Looking forward from the club section of the Inter-City Coach De Luxe. Note the deep, leather upholstered seats; ample aisle and head room.

Beauty and Dependability of Studebaker Busses Win Discriminating Riders

CARRIED in its own sub-frame is the famous Studebaker L-head motor, quiet, powerful and of notably long life. The transmission has four speeds forward and one reverse, giving greater driving range without excessive engine speeds, a feature of particular advantage in city operation and in hilly country or on long fast schedules.

Studebaker engineers have incorporated in the new Studebaker Inter-City Coach De Luxe every feature necessary for economy of operation and the safety and comfort of the riders. Passengers are naturally attracted to Studebaker busses because of their clean-cut appearance and regularity of service. The new Inter-City Coach De Luxe is a most distinctive looking bus. The black enamel fenders and disc steel wheels contrast sharply with the body. A wide letter strip is set off with two striped mouldings which carry out the stream-line effect from the cowl and hood. Heavy nickel-plated bumpers front and rear; nickel-plated radiator; spare tire carrier on the left; automatic windshield cleaner; and rear-vision mirror are standard equipment.

Prices of Studebaker Busses

Studebaker "75" Chassis only*	$3275.00
Studebaker "75" Parlor Observation Car*	6895.00
Studebaker "75" 21 Passenger Street Car bus*	5895.00
12 Pass. (including driver) cross-seat Sedan-Type	3935.00
15 Pass. (including driver) cross-seat Sedan-Type	4295.00
19 Pass. (including driver) cross-seat Sedan-Type	5050.00
18 Pass. (including driver) side entrance ParlorCar	5300.00
20 Pass. (including driver) Parlor Car De Luxe*	6150.00

*Includes dual rear wheels.

All prices f. o. b. factory. Purchase can be arranged on Liberal Budget Payment Plan.

Correct Ventilation and Heating

Proper ventilation and heating are two scientific problems that have been mastered in this new coach. Side windshield ventilators and two roof ventilators keep the air in constant motion. The wide windows held in grooves of deep felt are easily adjusted. In cold weather a constant flow of warm air from raised floor radiators insures an even distribution of heat.

Mounted on the Studebaker "75" Bus Chassis

The proved mechanical excellence of the "75" heavy duty chassis enables bus operators to meet time table schedules with due regularity. This chassis of 184 inches has nine heavy cross-members including two 3-inch tubular units at the center which give great rigidity to the frame. Every unit in this chassis, including the four-speed transmission, large double plate clutch, universal joints and extra heavy rear axle, is designed and built to give giant strength.

The Studebaker Corporation of America

SOUTH BEND, INDIANA

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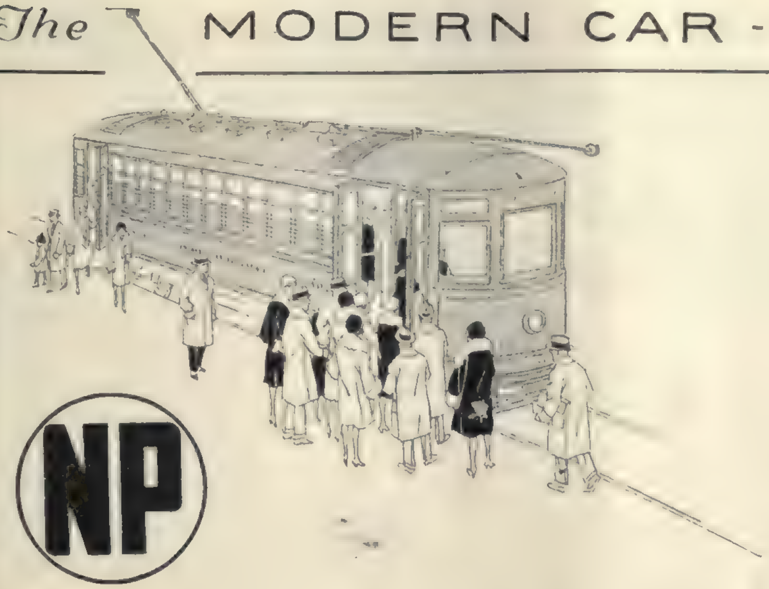
The MODERN CAR - [No. 1 in a series]



NP

Partially Modern or *Thoroughly* Modern?

A STREET car is *truly* modern only when *thoroughly* modern.

It must meet all modern needs *in full.*

The demand for faster schedules, for example, can be attained by the use of the latest type of door and step equipment.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York
General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

PHILADELPHIA
1010 Colonial Trust Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

Here are
BEAUTY
SPEED and
COMFORT

The appeal of appearance!
Passenger Preference!
Public Interest and Friendship!

At last year's Convention these phrases indicated a very definite trend of thought in our industry. This year they will be uttered again with a strong conviction of their importance. Operators now have plenty of proof that progressive merchandizing of electric railway service produces results.

Further than this, operating statistics from many of the most successful modernized properties prove that Cincinnati BALANCED DESIGN has produced cars so attractive, so thoroughly modern and so distinctive that public approval becomes a certainty.

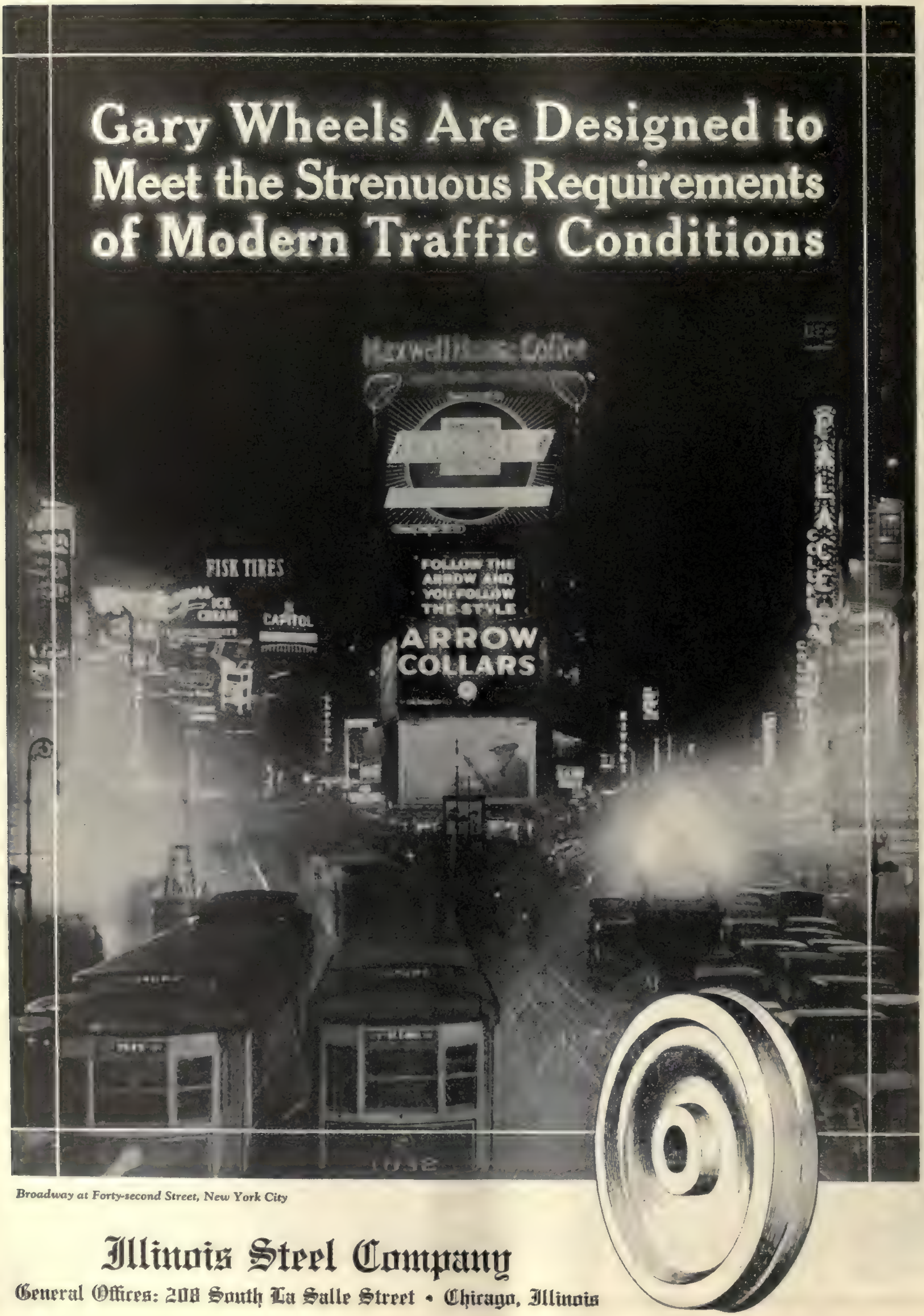
BALANCED DESIGN does more. It establishes a principle of car building of proved soundness from the viewpoint of operating economy.

When you buy Cincinnati Lightweight NEW Cars you make no experiments. Tangible results can be predicted with more than usual certainty.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI
New
CARS

~ A step ahead of the modern trend

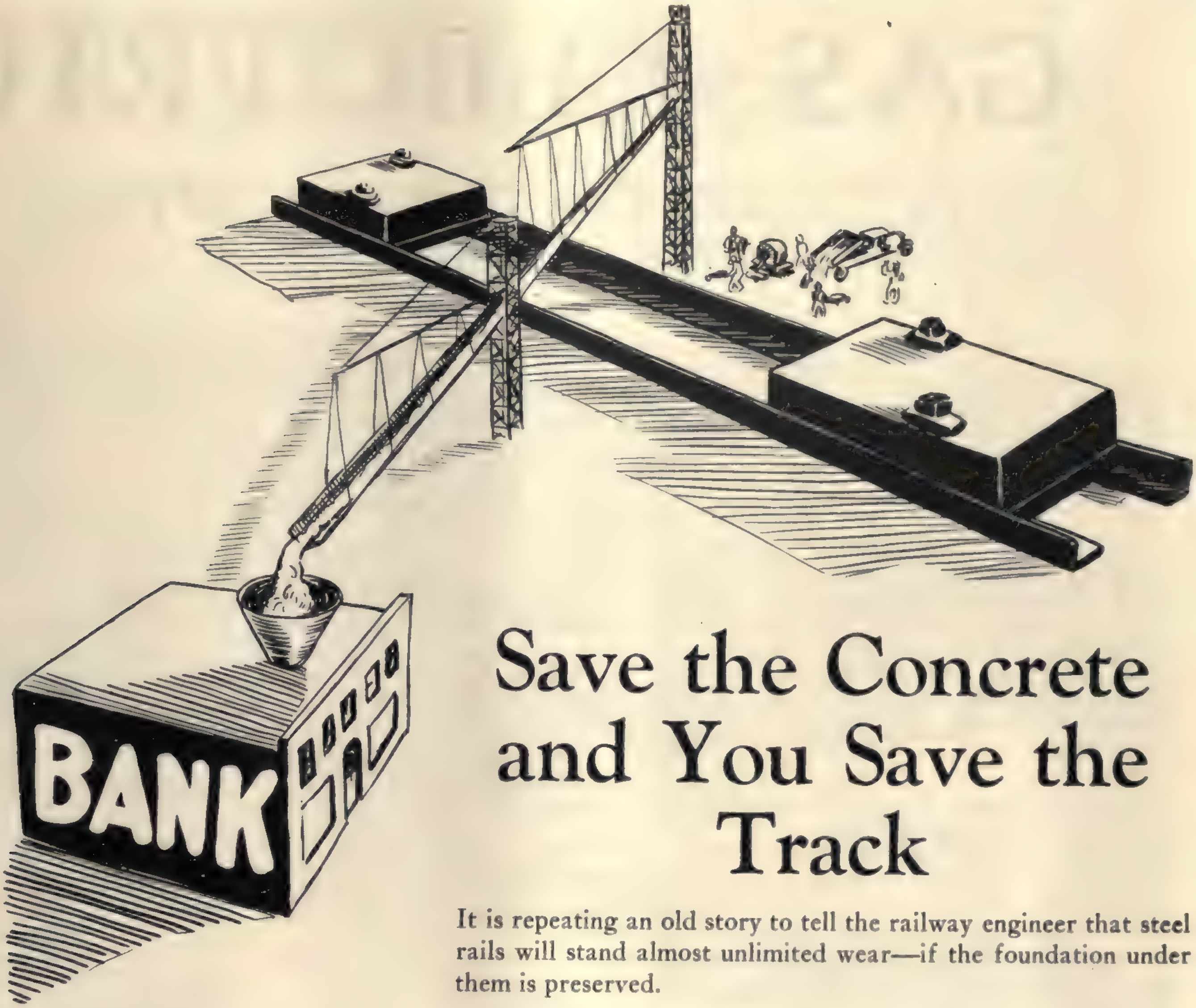


Gary Wheels Are Designed to Meet the Strenuous Requirements of Modern Traffic Conditions

Broadway at Forty-second Street, New York City

Illinois Steel Company

General Offices: 208 South La Salle Street • Chicago, Illinois



Save the Concrete and You Save the Track

It is repeating an old story to tell the railway engineer that steel rails will stand almost unlimited wear—if the foundation under them is preserved.

But, because track foundation under paving cannot be constantly ballasted up as steam roads do, the only recourse for street railways is concrete foundation.

But concrete track foundation does not stand vibration. Some means must be provided to absorb the vibration of the cars running over the track.

The answer—Dayton Ties, of course.

Designed and constructed to completely absorb this vibration, they have clearly demonstrated their ability to do so for years. Since the inception of Dayton Ties fifteen years ago, more than 125 cities have put in one to ten installations each, and not a foot of it has ever failed, or cost a penny of maintenance.

Where track has been opened—the concrete foundation, the ties and rails have always been in perfect condition—not a sign of deterioration.

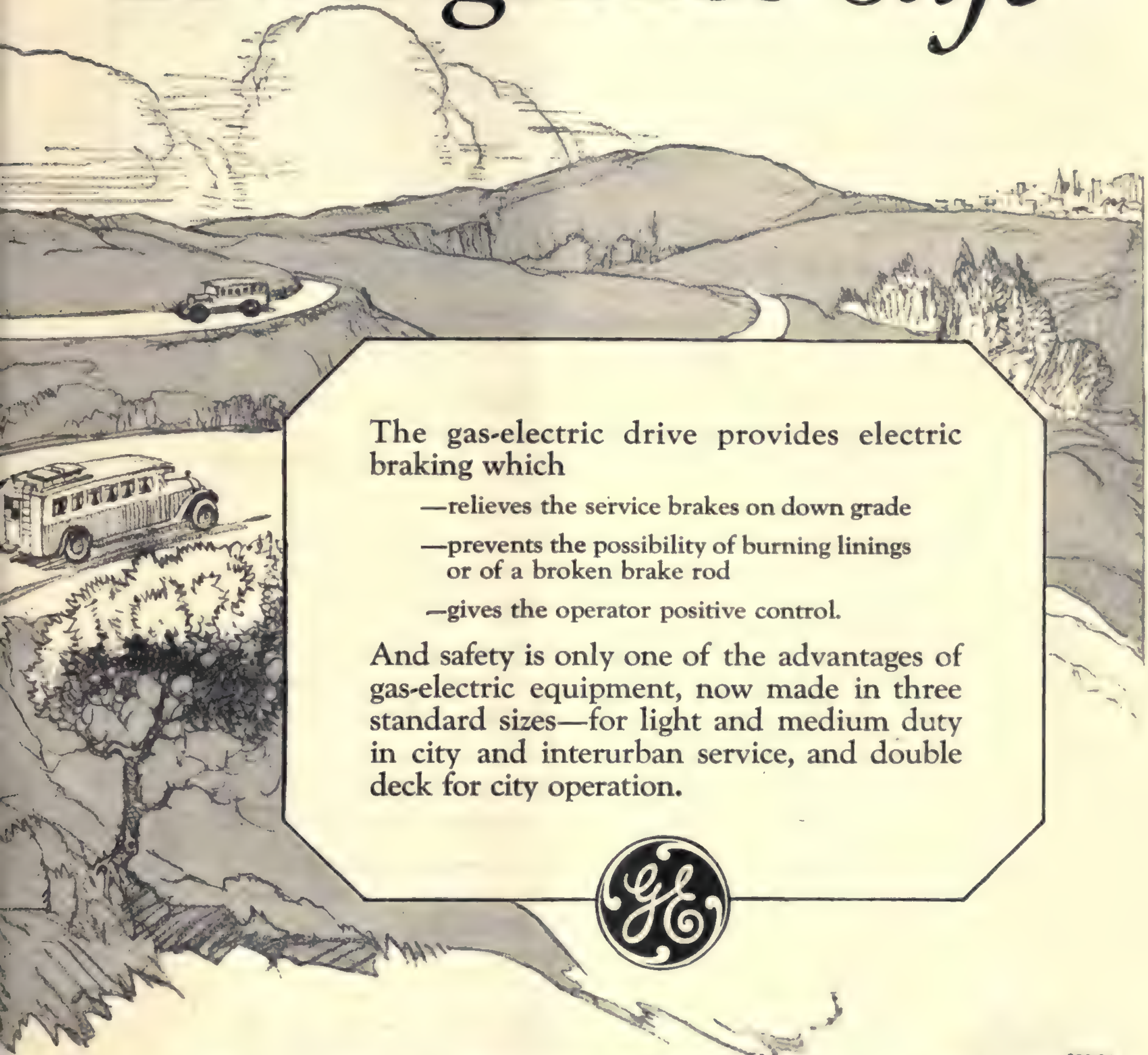
The Dayton Mechanical Tie Co.
DAYTON, OHIO .

GAS-ELECTRIC

GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y

DRIVE makes down-grades *safe*



The gas-electric drive provides electric braking which

—relieves the service brakes on down grade

—prevents the possibility of burning linings or of a broken brake rod

—gives the operator positive control.

And safety is only one of the advantages of gas-electric equipment, now made in three standard sizes—for light and medium duty in city and interurban service, and double deck for city operation.

390-24

ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES

The 175 modern cars in Providence, R. I., are each equipped with four GE-265 Motors and K-Control. These 700 G-E Motors are among the 40,000 modern motors that are helping electric railways to give dependable service.

What large-scale modernization has done in Providence

Since 1921 the United Electric Railways Company, Providence, R. I., has placed in operation 175 modern cars—79% of its cars in basic service. These had made about 13,800,000 car-miles prior to Jan. 1, 1926.

In 1925 operating costs were 36.77 cents per car-mile, compared with 39.91 in 1921, and this even though a complete overhauling of cars has been in progress for 1½ years.

Maintenance costs per car-mile for Account No. 30 (passenger and combination cars) and for Account No. 33 (electrical equipment) were reduced respectively 10% and 20% for 1925 as compared with 1921.

Pull-ins per 1,000 miles were reduced to 0.292 in 1925, as compared with 0.67 for 1921, a reduction of more than 50%.

The greatest saving has been the reduction of nearly 20% in platform expense, although two-man car operators now receive 9% higher and one-man car operators nearly 20% higher wages.

The Providence management found that modern one-man, two-man cars transport passengers more safely and more economically; that they are superior to its converted one-man cars because they accelerate faster, consume less power, and reduce track wear; that they reflect favorably on the company and on the community.

330-28

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 25, 1927 *Number* 26

San Francisco's Municipal Railway Bond Proposals to Be Resubmitted

RESULTS of the bond election on June 14 leave San Francisco in a peculiar position. As things stand the city is faced with the problem of a municipal railway tunnel and no money to run the railway through it, the same situation with respect to the Bernal cut, and no place to put Hetch Hetchy water when it arrives. The proposal for municipal railway extensions and additions involved the sum of $4,700,000. So far as the extensions are concerned, a part of them, particularly the Sunset-Judah line, are in the nature of a moral obligation. They were pledged at a time property was assessed for other improvements. The Sunset District paid $1,700,000 for the tunnel and felt that it was entitled to a promised rail extension.

Proponents of the measures defeated at the election say the defeat was due to the small vote. Their idea is to realign their forces so that the matters can be resubmitted at the regular municipal election in the fall. The reasons advanced for the defeat of the measures may or may not be correct, but it is in the record that they were defeated and that the city officials are confronted with the serious situation to which reference has been made. It does seem, however, that the citizens of San Francisco were particularly apathetic about a matter so important to some of them. Certainly the proposals were not without their vociferous adherents. The leader of these quite naturally was the *Examiner*. One of its flights of editorial fancy was headed "Muni Cars Have Created Miracles in New Wealth." That paper said that while the city of San Francisco had grown 57 per cent in assessed value since 1912, five residential districts opened and served by the municipal street cars had grown 267 per cent, or five times as fast as the average. There is no reason to quarrel with this as a statement of fact, but even allowing full credit to the railway for its part in the increase, the statement is over-sanguine in its implications. The burden of the paper's song was that the bonds for extending the municipal cars into Sunset Parkside, Excelsior and other "new" districts deserved to pass by an overwhelming majority. With this the people of San Francisco, or at least the voters who went to the polls, did not agree.

All through the agitation over the submission of the issue to the voters, the Market Street Railway, privately owned, appears to have devoted itself entirely to minding its own business. Its activities took no cognizance of playing politics. Bereft of anything else to say following the election, the *Examiner*, realizing its position to be extreme, warned its readers to watch for corporation moves, saying that the Market Street Railway may confidently be relied upon to open up some sort of a drive to get the use of the people's Duboce tunnel and Bernal cut as its private right-of-way. Moreover, that paper renewed its prophecy to the effect that the "Market Street Railway will try to lengthen and strengthen its tentacles upon San Francisco." All of which goes to show the extent to which the propagandist will go in trying to bedevil a situation in which the only desire of the one who stood by was to remain a silent spectator. It will be interesting to see what the people of San Francisco do when the matter is resubmitted to them in the fall.

Things that Are Too Cheap Are Costly

BEING a large consumer of oil and its by-products, the electric railway industry necessarily is vitally interested in the chaotic condition now existing in the oil industry, which has taken the form of a hysteria of over-production and an uneconomic variation of price. In common with other consumers, the electric railways are concerned with the question, where will this lead? In such a frame of mind, therefore, it would be well for the industry to study the analysis of the situation as recently made by E. W. Clark of Los Angeles, president of the American Petroleum Institute.

While claiming to possess no panacea, Mr. Clark in addressing 600 oil engineers and technologists at Colorado Springs has unearthed some salient facts that should clear the air considerably.

In pointing out the possible causes for the present situation, this authority stated that the system of oil production was not designed deliberately by any one. It is not some prearranged co-operative thing. In times past the industry was in much the same position as a man who stokes his furnace in hot weather, thereby violating both an economic and a physical law. Production has run around the industrial cycle because this lesson has not stuck and the industry has failed to check or limit its individual activities until so late that none of the operators seems at this time wise enough or powerful enough to stem the flood. Continuing further, we read that the more wells the industry drills at the same time, the greater the per barrel increase in the cost of the total oil recovered from the pool; second, that the more wells drilled at the same time, the more gas pressure is immediately released, thereby diminishing the total ultimate oil recovery because maintenance of gas pressure increases the rate of yield and the total amount obtainable, and, third, that the more wells that are drilled at the same time, the greater the likelihood of bringing to the surface a quantity of oil which will be forced on an over-supplied market at a price so low as to lead to wastefulness and disregard of essential values.

Overshadowing these elements of inefficiency and waste, it is learned that the present critical situation must not be considered merely in the terms of the Seminole, Earlsboro, Spindletop and Panhandle strikes, but from the greater perspective of the world's ultimate production. Russia, Venezuela, Colombia must be considered; also the great Persian Mesopotamian area of the middle East, all of which dwarf the significance of a few local and temporary phenomena of oil production here in the United States.

From these very candid admissions, we may deduce much that is helpful. The oil industry, in other words, has no standardized program. Apparently it is every man for himself and the devil take the hindmost. There has been such a wealth of production in this country that it has neglected the future staggering competition that is breeding in other countries. Over-production has, as is always the case, opened the gates for mushroom operators who, when production decreases, are generally forced out of the game, thereby leaving the large producers to fight a competitive battle.

With this last deduction we come to the crux of the situation in so far as it affects the electric railway industry. As an industry we have stood for one management in one area. This stand does not necessarily mean that we approve of a combination in restraint of trade; rather is it a combination to give better service. But on the other hand, indorsing single management that furnishes adequate service creates a reserve for improvements and in general protects the public as opposed to fly-by-night operators, inadequately financed, who in the end work to the detriment of those who consume their products. This situation is analogous, in so far as the industry is concerned, with oil and oil production. As consumers the railway industry, therefore, must subordinate its desire to buy cheaply to the sounder economic consideration of helping a big industry to stabilize prices and production that will result in uniformity and in the long run greater economy. It must stop looking through the wrong end of the telescope and remember that the things that are too cheap are costly.

Public Transportation Operators Must Lead in Solving Traffic Problem

WITH each sale of an automobile the traffic problem increases. While a few years ago it was only in the largest cities that traffic congestion was serious, today even modest hamlets have their crowded intersections, with officers directing the movement of vehicles. So serious has the problem become that public transportation, whether by street car or by bus, is seriously hampered. The organizations giving this service cannot sit quietly by and allow the civic authorities to handle the situation unaided. All too often city officials do not sense the real difficulty, and even when they do they are prone to heed the owner of the automobile in his claim for preferment as against the street car or bus.

A situation such as this demands that the street railway man, instead of drifting along with the current, become the leader in devising plans to ameliorate conditions. It is true that the transportation company will be the chief beneficiary. It is equally true that every resident of the community and every visitor to it will be the gainer if a solution is worked out that brings real relief. Petty jealousies and claims for preferment must be cast aside, and every proposal must be judged on its merits.

That much can be done in improving traffic conditions is indicated by the analysis presented by L. M. Traiser in this week's issue. The importance of an adequate traffic survey cannot be over-estimated. Only with complete information can the true requirements be determined, and only with the facts before them can those in control deal justly with the various elements. Such things as the use of intersections, the waste of time due to wrongly placed and wrongly operated signals and the evils of street parking can be taken from the realm of conjecture into the field of cold statistics.

As to the answer, it may differ in each community. There is a certain similarity, however, which makes it possible to lay down rules that must be followed to obtain real relief. Some of the elements are mentioned by Mr. Traiser, and there are many others with which the experienced traffic man is conversant. As in so many other features of transportation service, only co-operation will bring about the best results.

Showmanship May Be a Necessary Element

ON ANOTHER page of this issue is an account of the celebration staged by the Cincinnati, Hamilton & Dayton Railway to mark the completion of its rehabilitation program. There is no need to repeat here the features of that event, the most spectacular one being a bonfire in which the old cars were destroyed, but it is fitting that its significance be considered for a moment.

First, there is the fact that the management of the C., H. & D. was quick to recognize a good idea developed on another property and to apply it as a means of winning public interest and attention to the completion of a laudable rehabilitation program. Grand Rapids had shown the way. The C., H. & D. took up the idea and used it with attention to arrangements and details that reflected a ready grasp of the mechanism of showmanship. In the past the tendency has been too pronounced to deprecate rather than to utilize new ideas developed on other properties.

That this public celebration to mark the passing of the old facilities and the coming of the new succeeded at least in arousing great public interest was indicated by the thousands of automobiles that jammed for hours every approach to the bonfire, and by the good-natured multitudes that cheered and applauded every event on the program. There was no question left in the minds of observers but that the effort and money expended by the railway were repaid many-fold in good will and community-wide publicity. It was evident also that the success achieved was attributable largely to the meticulous care with which even minor details of the event were planned and the accuracy with which public reactions were anticipated.

What, then, does this signify? Surely there is something more in the C., H. & D. celebration and the results accomplished than merely that another railway held a public bonfire of its old cars. That something seems to be that there is another component in the little understood term "Merchandising Transportation." The industry is just beginning to understand some of the rudiments of salesmanship and of advertising. It is beginning to understand that the first step in merchandising anything is to make the product fit the public demand. Now there seems to be reason for concluding that "showmanship" may also have an important place in attracting public interest as a step in a merchandising program.

Remember, There's Always a Private to Wield the Marshal's Baton!

JUST as though belated recognition were denied it, democracy occasionally does something sensational which focuses the attention of all upon its exploits, deals a blow to the persiflage of the superior ones and wins new sympathizers to the "up from the ranks" theory. Such a condition has arisen following the awarding of 1927 commissions at West Point to two honor men who were appointed from the regular army to the academy, entrance to which was barred to enlisted men until a few years ago. The accomplishments of these two cadets prove that they are at least not inferior to the West Pointers, and it may prove that their former training was instrumental in their success.

"Up from the ranks" is a drama with good material on any stage. On the railway stage there are many supers and extras who could well take the lead if they were given the opportunity to show their latent talents. The disposition has been growing to take into greater account the unheralded employee who is up for a position of responsibility and trust, but the road to success will be traversed by many more willing feet only as this inclination to consider the possibility of men who constitute the rank and file becomes more and more pronounced.

In the railway field the desideratum is the right man in the right job. Often it is realized. There will be occasional misfits, but there will be fewer maladjustments when the managements consider enthusiasm and capacity for hard work attributes of the prospective promotee, for frequently linked with them is a talent waiting only development.

Stories of men who came "up from the ranks" in the railway business may be lacking in the sensationalism attached to the success of the honor men at West Point, but nevertheless they are pleasing parallels. These recitals of "career" men should serve as an inspiration to the employee still groping his way out of the ranks and as a corrective to that fallacious note in "up from the ranks."

Progress that Is the Result of Intelligent Work

SOME one has said that progress is the result of intelligent work; that there is no goal previously attained but what can be passed. These maxims have been splendidly substantiated by the exhibit committee of the American Electric Railway Association, which after 29 working days reports the sale of 105,402 sq.ft. of exhibit space for the next annual convention. This figure represents both progress and the fact that a previously attained goal has been passed. It represents, however, more than this when we view the committee's endeavors in the light of the industry as a whole. The very fact that there were at the close of business June 18 22 more applications than for the same period last year reveals a fine effort on the part of the manufacturing interest allied to the industry to place before operators all that is best and latest in the way of improvements. The increase in applicants also gives the lie to those who assert that the street car is doomed.

So much then is the result of 29 days of consistent, intelligent work, into which has been infused the infectious enthusiasm of the man who is the director of exhibits for the association. But this is only a beginning. There are several months ahead in which opportunity will be given those who have not yet applied for space to build on the foundation which the committee has so thoroughly prepared. It is to their interest to follow the example of more than 200 co-manufacturers whose abiding faith in the industry points a moral and adorns a tale. Their faith has been expressed in deeds, and their leadership should beget many followers.

Keeping Abreast of Public Demands Is an Endless Process

MONEY in ever-increasing quantities must be poured by the railways into plant and equipment needed to meet increasing public demands. There is nothing new in this to railway men, but there is a great deal that is new about it to the general public. And the railway misses an opportunity when it does not enlighten the public on this matter.

No annual statement worthy of the name but contains some tangible reference to the sums so spent. One that comes forcefully to mind, however, is the record of the Boston Elevated Railway in this respect. The expenditures for plant and equipment do mean something, and in the case of this company they have meant the sum of $33,570,000 in the last 8½ years of the public trusteeship. This money has been divided as follows: Cars and buses, $15,463,000; carhouses, shops and garages, $6,171,000; power houses and transmission of electricity, $4,117,000; surface lines (track and line betterment), $4,906,000; elevated structure and appurtenances, $2,013,000; miscellaneous improvements, $900,000. In addition to these sums, $3,434,000 had been expended upon road and equipment in excess of any capital issues at the time the trustees took charge of the railway on July 1, 1918, making the grand total to be provided for during the 8½ years of public control about $37,000,000.

It is estimated that $18,856,000 of this was available from depreciation charges, but the rest had to be financed and it was no easy task. And the Boston Elevated hasn't overdone the thing by any means. Last year the system carried 6,000,000 more passengers than were carried in 1925. In all 2,385,255 more miles were run and 338,144 more round trips were operated. The number of bus-miles almost doubled. In its effort to keep abreast of its obligations replacement of the last wooden elevated cars, 100 in number, has been undertaken by an order for a similar number of modern steel cars. Eighty-one buses were added during the year to cover the lines on which bus operation had been started.

This, of course, is only one example, but the case is typical. On other roads it varies in degree but not in kind. Expenditures so made are an object lesson that may well be turned to account by electric railways everywhere. The power to influence of such figures is great when spread on the record, and the public cannot mistake their import in terms of increased service and added comfort. This increased service and this added comfort are not the public's inherent right. It is theirs only by virtue of their use of the service and their willingness to pay a fare that makes it possible to set up adequate depreciation reserves and to finance expansion that calls for the use of new money.

Railways Can Take Lead in Reducing Traffic Congestion

Reduction in cost of operation, increase in revenue and a better position in the community await leadership by electric railways. Intimate knowledge of the present situation, coupled with ability to make necessary engineering analysis, qualifies railway operators to aid solution of baffling community problem

By L. M. Traiser
Special Traffic Engineer Chicago Surface Lines

Mid-block turns on a busy street cause delay to all forms of traffic

RAPID increase in use of motor vehicles has produced a serious traffic situation in American cities. The opportunity which present street conditions offer to public transportation companies to reduce operating costs, increase revenue and build for themselves a better position in the community should induce railway operators to take an active part in helping their communities to work out measures for the relief of street traffic congestion. There is in the present traffic situation both a reason and an opportunity for railway executives to win a position of leadership.

Since every active person in a community must use the streets to carry on business or other activities, traffic dangers and delays are of common interest to all citizens. The cost of doing business, the expense of distribution and, as a result, the cost of living itself have been and are being increased by street traffic congestion. Street railways, earning practically all of their revenue on these streets, are particular sufferers in the form of increased operating costs and revenue losses. In serving their own interests, therefore, they are in the happy position of being able to help in the relief of a most serious and baffling community difficulty.

Traffic congestion not only delays car service directly and increases the cost of operation but it is also the cause of service interruptions caused by the breakdown of other vehicles using the tracks. In Chicago 30 per cent of all street car delays of five minutes or longer are caused by vehicles over which the company has no control. Thus participation in traffic relief work offers many benefits to railway managements.

Railways Profit Through Co-operation

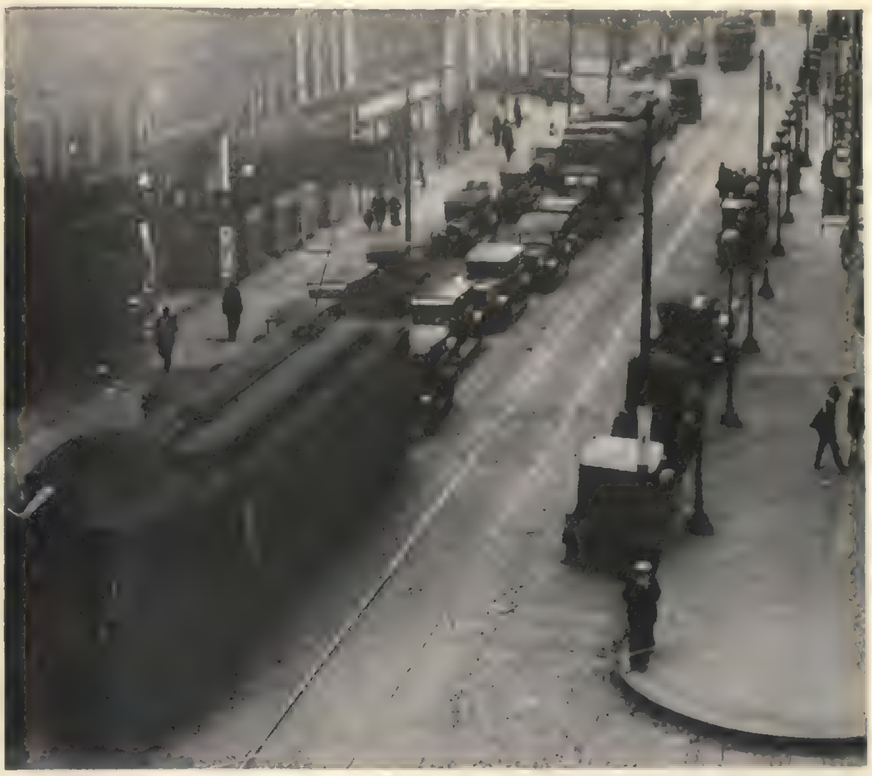
There are not only rising costs and service interruptions to combat but a genuine opportunity to improve the company's position in the community. Co-operation with municipal and civic groups opens to railway operators valuable contacts with leaders in business and civic life on a ground of common interest. Railway executives should be known for leadership. The street traffic situation in most cities offers to them the means of winning such recognition. City-wide knowledge of conditions on principal thoroughfares, in congested districts and at important intersections gives the railway management at once a broad view and authoritative data bearing on regulation and traffic control. Familiarity with traffic speeds, car headways and physical limitations of streets and districts are of great value to civic leaders in conducting intelligent traffic studies.

In working to expedite street car movement railway operators and their engineers have learned fundamentals which can be successfully applied to promote movement and reduce conflict of all street traffic. This intimate knowledge of the situation, coupled with experience which makes them expert in the conduct and analysis of traffic studies, may be profitably capitalized by railway operators.

TRAFFIC SURVEY ESSENTIAL TO INTELLIGENT CONTROL

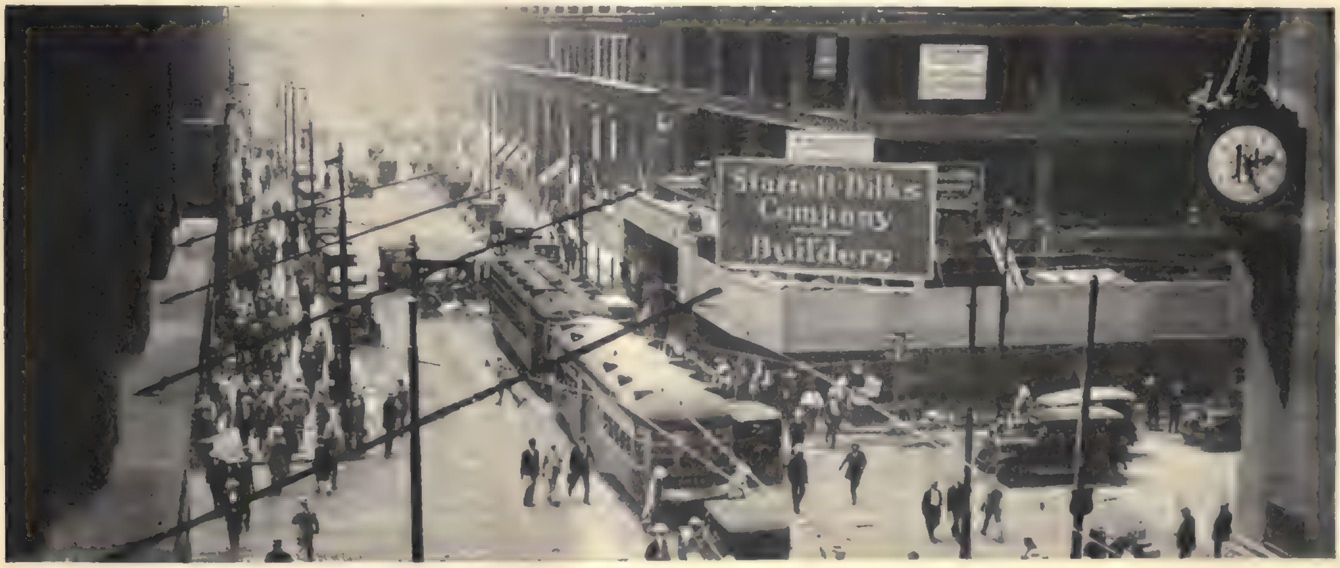
The purpose of traffic surveys should be to collect information and data with regard to the present situation and on this basis to determine means of using the existing street facilities more effectively. Of prime importance in this investigation is the collection and use of facts. Satisfactory traffic control cannot be built upon casual observation or guesswork.

The traffic survey should be city-wide. Congested streets are not limited to any one section. A comprehensive view of the entire community is needed for intelligent relief of congestion. Knowledge of volume and speed of traffic, types of vehicle used and flexibility of movement enjoyed are essential in the study of congested districts and intersections. To this should be added a study of the factors causing congestion. Foremost among these factors will be found: Growth in commercial activities; concentration of industrial and passenger traffic demands in given districts; physical limitations with regard to street space and traffic outlets.



Parking on narrow car line streets forces all traffic onto the tracks and delays car riders

With this information known the second step is the application of this knowledge to bring about increased safety and convenience, while at the same time expediting traffic movement. Flexibility and convenience for the individual should be retained in so far as that is possible without serious delay to the major traffic movements. Investigation often shows, however, that unlimited flexibility and the conveniences represented by left turns, parking or turns within a block serve only a relatively small number of people at the expense of many who must use the streets. In such a situation the rights of the individual must give way to the needs of the community. The traffic regulation policy should be built on the principle of the greatest good to the greatest number.



Unloading building materials during heavy traffic hours is an example of street use which causes serious delay to traffic movement

A fundamental code of street use may be built up on this principle. It will have for its object the reduction of congestion and accidents through co-ordination of traffic movement to reduce friction and interference. This should be set down as a simple, enforceable code of regulations based on traffic requirements and street limitations.

The past five years have witnessed a tremendous increase in the use of traffic signals. Unfortunately, many installations have preceded proper studies of traffic volume and routes. Unnecessary and improperly timed traffic signals have been the result. Investigation of one installation on a heavy car line in Chicago exposed the fact that more than 20 per cent of the time was allotted to a movement of only $\frac{4}{10}$ of 1 per cent of the passengers using the intersection. The time wasted by this signal in a single day was tremendous. Where a conflict of heavy traffic movements warrants the installation of signals to increase safety and flexibility they should be fitted to the intersection by a study of the particular traffic to be accommodated.

Use of important thoroughfares for the storage of building materials and hoisting apparatus is a serious obstacle to traffic which causes delay to thousands of people

Probably the greatest advantage of mechanical signal control comes in the progressive movement which can be brought about on heavy traffic streets or in congested districts. This progressive movement obtained with co-ordinated signal control has the obvious advantage over the present widely used synchronized control in that the time allotted to cross movement at each intersection may be in proportion to actual traffic demands at each intersection, instead, as is the case with the synchronized control, of being determined by the volume of traffic at the heaviest intersecting street. Progressive movement of traffic provides a high average speed and a definite check against high crest speeds that makes for safer and more orderly movement. Such a system, similar to one originally developed for the Loop district in Chicago, has been designed on Michigan Avenue to control traffic over 35 intersections covering a distance of more than 3 miles on this important thoroughfare. The installation displaces a synchronized system and is expected to improve materially the average speed and regularity of the traffic stream.

The co-ordinated control of heavy traffic at more than 45 intersections in the central business district of Chicago has been in successful operation for more than a year. In both this and the Michigan Boulevard improvement engineers of the Chicago Surface Lines suggested the method of control to be used and worked out the details of signal timing. Close co-operation in the work of improving conditions in the city has made the street railway one of the leaders in bringing about traffic relief in Chicago. The good will and public confidence which have thus been won insure continuation of the policy of co-operation that has been established. Thus the car rider is given proper consideration in the regulation of traffic and at the same time street conditions have been improved despite a constantly mounting traffic volume. There are situations in every city where better street traffic conditions will result from intelligent relief measures. In this work the street railway will do well to take an active part.

The city of Coral Gables, Coral Gables, Fla., through its engineering department, is drawing up plans for the building of a carhouse to house the cars of the rapid transit lines recently turned over to the city for operation. The carhouse will be built, if approved by the City Commission at its July meeting, in the industrial section in block 12. The construction will be of concrete block about 40 x 150 ft. E. Friedman, chief engineer for the city, is handling the plans.

German Road Makes Progress[*]

Proposed Rhenish-Westphalian high-speed line will have approximate length of 115 miles. The main line will serve nine cities and several branches are proposed

By W. Cauer
Director of Engineering, Professor at the Technical High School, Berlin, Germany

DESIRE to give a high-speed connection between several of the principal industrial cities in the famous Ruhr district of Germany has led to plans for an electric railway that will provide frequent service with running time between the terminal cities about half that required by the State railway.

The project is not a new one. The first plan was made in 1904 for an interurban railroad from Cologne to Düsseldorf. The second project was for an interurban line between Düsseldorf and Dortmund. This project was worked out by order of a union of the towns in 1909 and provided for an electric line running on its own right-of-way and passing populated districts without entering the streets. The plan was rejected in 1911 by the Prussian Minister of Public Works as being an encroachment on the monopolized rights of the State railway, which would be able to cope with the traffic quite by itself by enlarging its existing system.

Due to the increased difficulties of handling passenger traffic after the war, all towns from Cologne to Dortmund combined again in 1920, in conjunction with the Rhenish-Westphalian Electric Company, to further a plan for an interurban railway from Cologne to Dortmund. In 1921 the State railway administration of Essen commented favorably on the plan of building a rapid transit railroad independent of the State railway system. By order of the town the Rhenish-Westphalian Electric Company worked out a preliminary plan, with the result that in 1922 the general preliminary design was submitted and a franchise to build the railroad was asked for. In January, 1924, the Prussian Government, with the consent of the German Empire, granted a 99-year concession for building and operating the rapid transit railroad system.

The time allowed for raising the joint capital stock and for the formation of the railroad company was two years. The main line plan was examined in detail. Estimates were made of building costs and the profits that could be expected. In view of the unfavorable economic conditions, an application was made for a three-year extension of the time limit to January, 1929, which was granted by the Prussian Board of Trade. The total capital required is 340,000,000 reichmarks.

The present plan covers a main line connecting the towns of Cologne, Düsseldorf, Duisburg, Mülheim, Essen, Gelsenkirchen, Bochum, Langendreer and Dortmund. A line between Duisburg and Essen by way of Oberhausen is also planned. Details of the branch line Duisburg-Hamborn-Dinslaken, Duisburg-Moers and Essen-Gladbeck are not yet settled, nor are the intermediate stations finally decided. The Essen-Gladbeck line will have to make a large number of stops as it has to compete against an existing tram line.

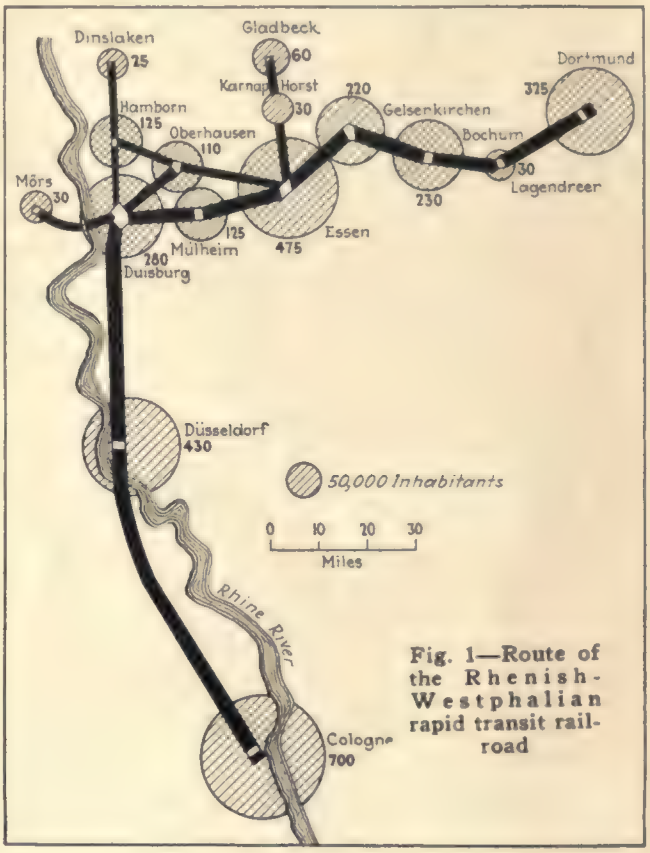


Fig. 1—Route of the Rhenish-Westphalian rapid transit railroad

All of the main line stations are placed in the business centers and, except in Düsseldorf and Bochum, the sites are close to the State railway stations. In general the stations are to be of simple design. At Duisburg, the junction of several lines, there will be a depot annex and a repair shop.

The main line will be built first. Between Cologne and Duisburg the maximum speed will be 81 m.p.h. and on the sections further east it will be 61 m.p.h. On the average, trips made will take only half the time neces-

PASSENGER CAPACITY OF TWO-CAR TRAIN ON NEW GERMAN HIGH-SPEED LINE

Car		Seats	Space for Standees	Total Passengers Each Class	Total Passengers In the Car
No. 1,	Third Class......	85	95	180	180
No. 2,	Third Class....	47	52	99	180
	Second Class...	33	48	81	180

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[*] This article is based on information contained in two articles published in *Verkehrstechnik* during 1926, supplemented by other information recently received by ELECTRIC RAILWAY JOURNAL from Mr. Cauer.

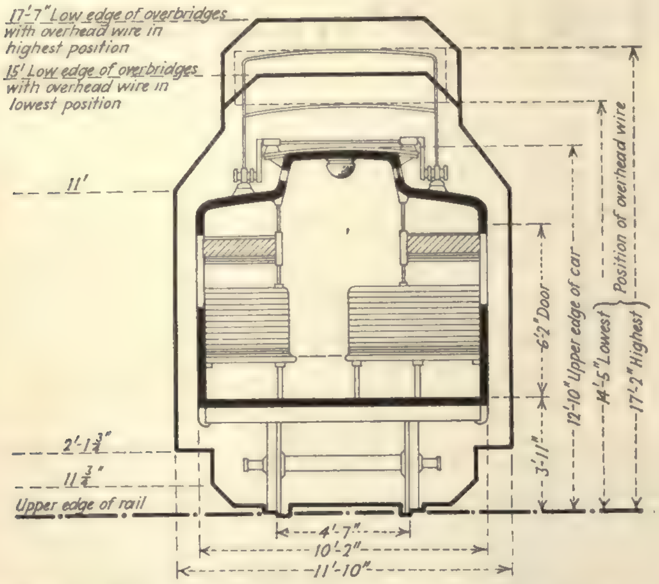

17'-7" Low edge of overbridges with overhead wire in highest position
15' Low edge of overbridges with overhead wire in lowest position
11'
2'-1¾"
11¾"
Upper edge of rail
4'-7"
10'-2"
11'-10"
6'-2" Door
3'-11"
12'-10" Upper edge of car
14'-5" Lowest
17'-2" Highest
Position of overhead wire

Fig. 2—Clearance diagram for the rapid transit railroad

sary to travel by the State railway. The whole journey from one end of the main line to the other will take less than 1½ hours. During off-peak periods trains will run at half-hourly intervals. This will be decreased considerably for rush-hour service.

To meet various traffic conditions long and short trains will alternate, spaced at varying headways. It is expected that service on branch lines will consist of short trains run at frequent intervals.

To provide a maximum schedule speed, all cars of a train will be motor cars. The shortest train is to consist of two cars. Each car will be 69 ft. 3 in. long, mounted on two trucks. The ends of the leading cars of a train are to be rounded to reduce wind resistance. Trains can be lengthened by adding intermediate cars with square ends up to a total of six cars. Stations and platforms are to be held in corresponding proportions. Each car will provide for a seated and standing load of about 200 passengers, according to the accompanying table. The power will be supplied to an overhead trolley at 1,500 volts direct current, transformed down from alternating current at 25,000 volts at substations and converted by means of mercury-arc rectifiers.

The track will be of modern heavy type, similar to that adopted by the State railway. Due to the high speed at which trains will run, all curves in the open country are to have a radius of not less than 3,280 ft. Fig. 2 shows a clearance diagram for the new line at the highest and lowest positions of the overhead wire. Fig. 4 gives a comparison between the rapid transit railroad clearance diagram at the lowest position of the overhead wire and the corresponding diagram of the State railway.

Crossing of roads and streets at grade will be avoided. In the open country the line will run as far as possible on embankments or through cuts. Inside towns it will be necessary to run underground.

In the Ruhr coal mining district lines must neither run through subways nor through tunnels, so the tracks will be elevated on an earth fill supported by retaining walls. Streets and plazas are to be crossed by bridges. All bridges within this area will be built with separate structures for each track so that it will be possible to repair tracks independently of each other.

The automatic block signal system adopted will employ three-position daylight signals which are visible even in foggy weather at great distances. Automatic safety stops will be provided to engage the brake mechanism if the train passes the signal in stop position. Besides this, at the approach to the terminals the train speeds will be reduced automatically. Other safety measures are provided by the use of three independent brake mechanisms. These are an air brake, a dynamic brake and a handbrake. If a motorman releases the dead man handle, an emergency brake application is automatically applied. Passengers also can stop the train by means of an emergency brake cord.

Plans for the branch lines are under consideration.

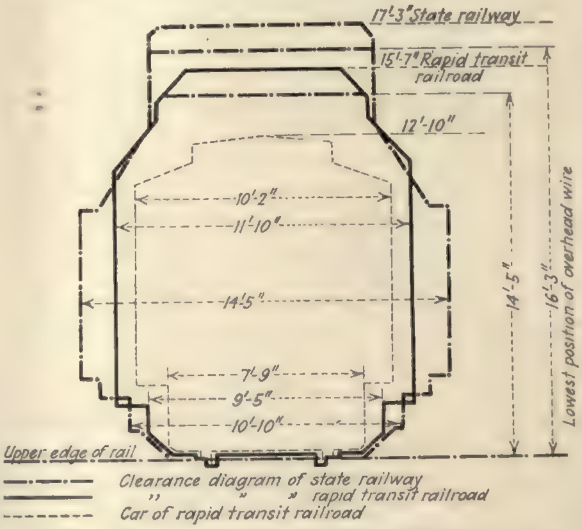

17'-3" State railway
15'-7" Rapid transit railroad
12'-10"
10'-2"
11'-10"
14'-5"
7'-9"
9'-5"
10'-10"
14'-5"
16'-3"
Lowest position of overhead wire
Upper edge of rail
Clearance diagram of state railway
" " " rapid transit railroad
Car of rapid transit railroad

Fig. 4—Comparison of clearance diagrams for the State railway and the rapid transit railroad

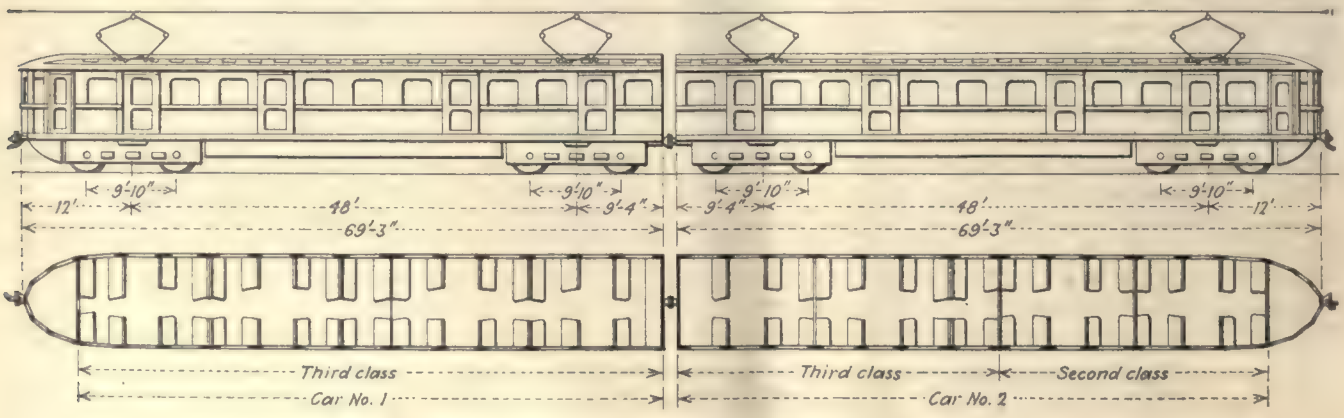


Fig. 3—Two-car train provides second and third class sections

New cars of this type have been of great advantage in holding the revenue of the rail lines in Portsmouth, Ohio

Co-ordination in Portsmouth, Ohio

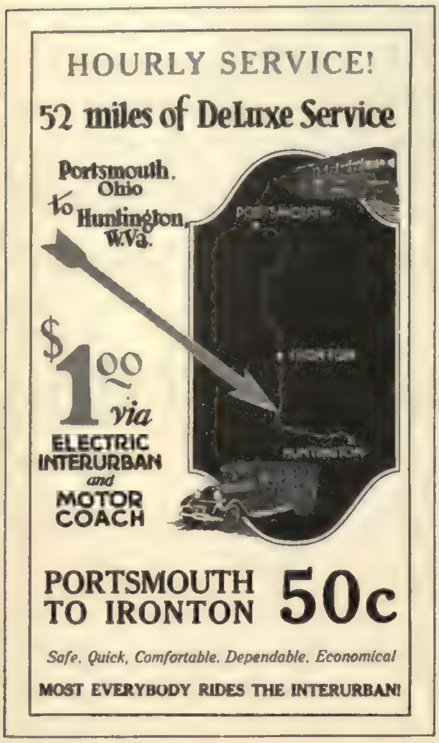
Modern cars and buses have increased the total revenue of the Portsmouth Public Service Company in the face of automobile and independent bus competition

MEETING modern conditions in a city of 50,000 population is a matter of considerable difficulty. The automobile has made so many inroads on revenue that even the most-talked-of plans have to be worked out with care to accomplish the salvage of the transportation property. Conditions in Portsmouth, Ohio, during the past several years have been similar to those in many cities of like size. With the use of new cars designed to meet the conditions of today, supplemented by bus service where it can be effective, the Portsmouth Public Service Company has been able not only to remain in operation but actually to increase the number of riders on its lines.

The company began modernization of its equipment in June, 1920, when six cars built by the Cincinnati Car Company were placed in service on one of the heaviest routes in the city. Three more of the same general type were installed in February and March, 1924. These nine cars give about 80 per cent of the local service, which takes altogether twenty city cars. A total of 1,580 car-miles per day was operated in 1926, at an average cost of about 39 cents per car-mile for all types of equipment.

The management is well pleased with the cars. They are light and have sufficient motor capacity so that they accelerate and retard quickly. Tests show that they are economical of power. The route is approximately 11 miles long, with light grades and good operating conditions. The tracks are on the heaviest traffic streets of the city.

The cars have a pleasing interior. At left, looking toward the front; at right, a curved seat gives comfortable accommodations in the rear of the car



HOURLY SERVICE!

52 miles of DeLuxe Service

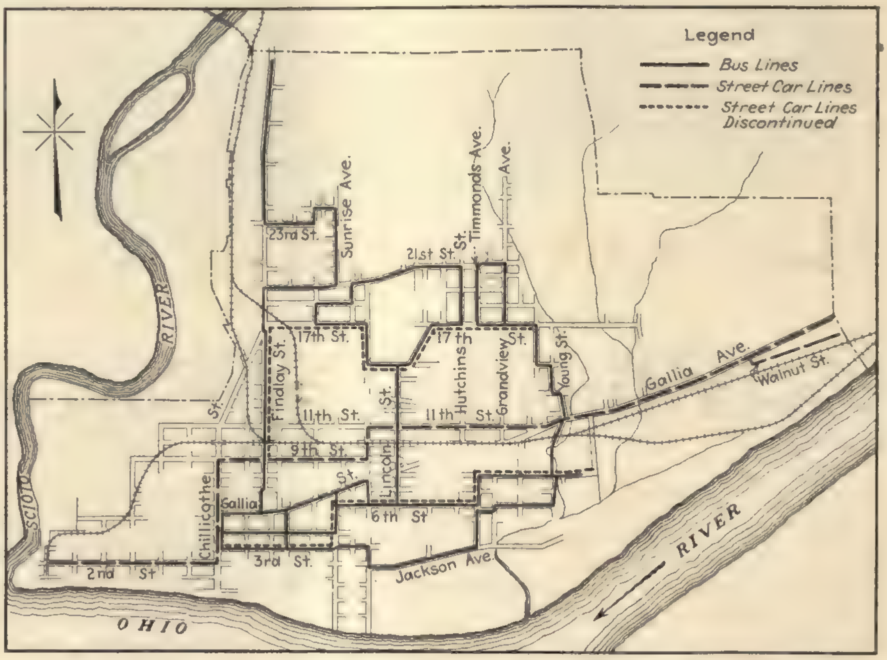
Portsmouth, Ohio to Huntington, W.Va.

$1.00 via ELECTRIC INTERURBAN and MOTOR COACH

PORTSMOUTH TO IRONTON 50c

Safe. Quick. Comfortable. Dependable. Economical

MOST EVERYBODY RIDES THE INTERURBAN!



Above—Bus routes have been used to replace some unprofitable car lines in Portsmouth, Ohio. At left—Placard advertising interurban service to Huntington, W. Va.

The city railway service is now augmented by bus lines, as shown on the accompanying map. The first of these lines was started on Nov. 1, 1925. Bus service was inaugurated originally to care for a number of outlying residential districts that were not served adequately but did not have sufficient population to warrant the construction of car lines. At first two bus lines with a total length of about 5 route-miles were run into the northern part of the city. Following discussions with city officials during 1926, railway service was discontinued on the Sixth Street car line, consisting of about 1.83 miles, and on the Seventeenth Street line, about 1.84 miles, a total of about 3.67 miles of track, and bus service was started as a substitute.

The buses do not run exactly over the former street car routes, as may be seen from the map. The total length of the bus routes today constitutes about 9.5 miles.

The regular schedule calls for half-hourly service on each bus route, with a total of 688 bus-miles per day. The city railway service is on ten-minute headway in the base hours, with five-minute headways in the rush.

The cash fare is 10 cents, with five tickets for 35 cents and 60 tickets for $3. The average fare is slightly under 7 cents. In 1921 the railway passengers per day averaged 9,100. Today, with greatly increased automobile competition and a number of bus lines operated by the company, the average is 8,200. According to company officials, the decrease would have been much greater had it not been for the installation of the new cars.

The fare on the buses is the same as that on the cars, the same tickets being used. Free transfers are issued between all lines, both car and bus. The average number of bus passengers daily is 2,700, so that the total riding of the system, 10,900 per day, is considerably more than it was in 1921, prior to the introduction of the new cars and the buses.

There is an agreement between the company and the city that the street car lines will not be abandoned permanently, but are only discontinued. The rails and overhead are retained in position, so that rail service can be resumed at any time it is mutually agreed between the city and company to do so.

Besides the city service, the company operates a bus line from Portsmouth to Wheelersburg, a town of some 500 inhabitants at a distance of 10 miles. The route runs over the main highway between Portsmouth and Ironton as far as Wheelersburg and it averages 277 bus-miles per day on an hourly headway and carries an average of over 1,300 passengers daily. Two buses are used to fill the schedule, averaging fourteen trips a day.

Fares are collected on the zone system. There are four zones, the fares charged being the same as those on the city lines, with the exception that the cash fare is 10 cents in the first zone and 5 cents in succeeding zones, or 25 cents cash for the entire distance. Cleveland locked fare boxes are used on these buses and on the city cars, while Ohmer registers are used on the city buses and on the interurban cars.

The buses are Whites with Kulhman bodies and all of them are equipped with Westinghouse air brakes.

INTERURBAN MEETS BUS COMPETITION

The company operates a 30-mile interurban rail line between Portsmouth and Ironton, Ohio, which has suffered greatly from bus competition. The line was projected in 1902, and was built as far as Sciotoville, now within the city limits of Portsmouth, in 1903. It was extended to Ironton and service was begun in 1916. The cars run every hour on the hour from Portsmouth, the time being one hour 18 minutes. After a four-minute layover the cars leave Ironton at 22 minutes past the hour.

There are two competing bus lines, one of them running half-hourly service between Portsmouth and Ironton. These two lines were cutting seriously into the revenues of the interurban, reducing the net earnings of the company accordingly. As a remedy it was decided to make a cut in fares and the rate was reduced from 90 cents to 75 cents. This was followed by a 60 per cent increase in gross revenue. The result was so satisfactory that a further cut to 50 cents was decided on. This produced another increase in gross business of 23 per cent.

Prior to the reduction in fares, the bus lines had been carrying more passengers than the railway. Traffic checks taken at various points before and after the change showed that conditions were reversed following the reduction. The shift in riding was not confined to any one class, but affected both long haul and short haul in about the same proportion. The checks showed that the bus competitors are now working at a load factor which precludes any possibility of profit.

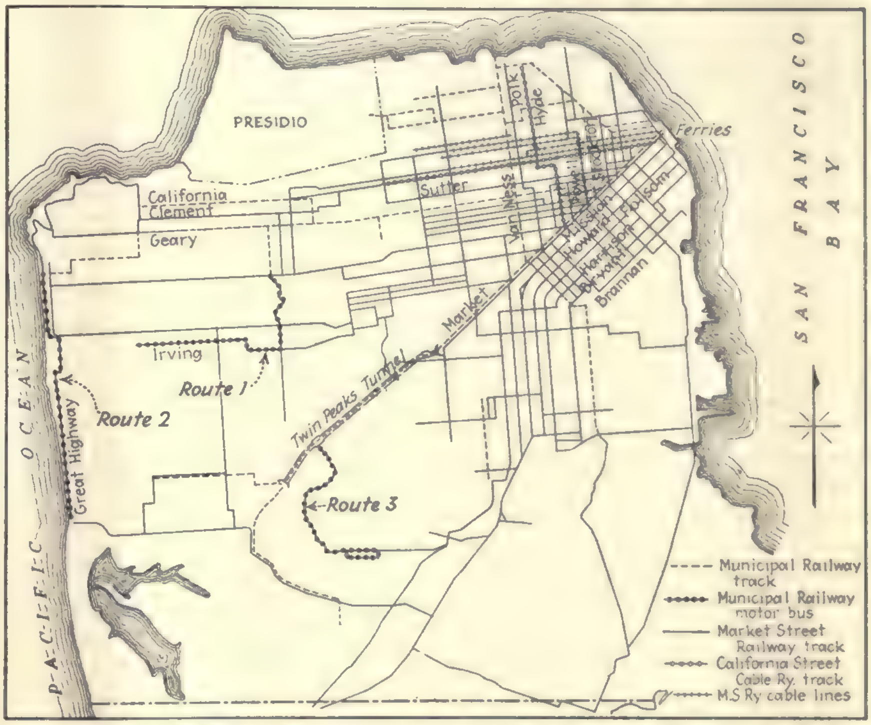
By co-ordinating with the Ohio Valley Bus company, a through service is rendered between Portsmouth and Huntington, W. Va., the buses furnishing the transportation between the latter city and Ironton, a distance of 22 miles. Schedules are co-ordinated so that close connections are made at Ironton. One of the advertising placards reproduced herewith shows how the through service has been featured. Combined with the low fare on the interurban, this joint service has been a material element in reducing competition.

Buses Operated in Feeder Service

Municipal Railway of San Francisco is using buses to augment rail lines in several districts where extension of tracks would not be justified

FEEDER and extension bus service is operated by the Municipal Railway of San Francisco to tap sections of the city unserved by rail lines of either the Municipal Railway or the Market Street Railway. Such service, however, is co-ordinated with the Municipal Railway and in no way competes with it or the Market Street Railway. Because of the very nature of the routes covered by the buses, the operation as a whole showed for last year a net loss amounting to approximately 7 cents per bus-mile. This loss is not viewed with any degree of concern by the management, because additions have been made to original bus routes so that they now render transportation service far in advance of the requirements. Moreover, bus operation serves as an indication of the need for transportation in a section of the city, and even now it is planned to replace a portion of one of the bus routes with rail service.

Three bus routes are operated, requiring thirteen buses. During the fiscal year ended June 30, 1926, the passenger revenue derived from these three routes amounted to $53,467. In addition to the passenger revenue obtained directly by the bus operation, a credit of 2½ cents is made on transfers originating on the street cars. This, together with school tickets and other revenue credits, amounted to $19,432, which brought the total passenger revenue and credits for the year up to $72,899. The operating expenses for the 449,886 bus-miles operated amounted to $105,945, resulting in a net loss for the year of $33,046, or 7.35 cents per bus-mile operated.



Bus routes of the Municipal Railway of San Francisco traverse sections of the city unserved by rail lines of either the Municipal Railway or the Market Street Railway

Bus service can be divided into two classes. First, feeders to the rail lines and, second, local or sightseeing routes along the Great Highway adjacent to the beach and amusement resorts. Under the first classification are routes Nos. 1 and 3, the former producing a direct passenger revenue of $27,691, constituting the most profitable of the bus lines, a portion of which is to be replaced by a rail line. Under the second classification is route No. 2, whose operation resulted in a passenger revenue of $20,836 for the year. This route, located as it is at western terminals of lines of both the Municipal Railway and the Market Street Railway, and covering the entire length of the beach for a distance of 2.75 miles, renders a local service in addition to feeding the rail lines. On Sundays and holidays the amount of local service requires five buses operating on approxi-

TABLE I—STATISTICS OF BUS ROUTES OPERATED BY THE MUNICIPAL RAILWAY OF SAN FRANCISCO

Route	Route Miles	Headway, Minutes Base	Headway, Minutes Rush	Buses Base	Buses Rush
1. Tenth Avenue and Fulton to 35th Avenue and Irving, through Golden Gate Park	2.67	7½	6	4	5
2. Great Highway, Cabrillo to Sloat Boulevard (Weekdays)	2.75	15	..	2	..
(Sundays)		7½	..	4	..
3. Monterey Boulevard	2.06	15	..	2	..

mately a seven-minute headway, and at times the traffic becomes so heavy that no reasonable amount of equipment could handle it. On week days, however, the traffic is light, requiring two buses to give a fifteen-minute service. On Sundays and holidays a revenue as high as $160 is obtained from this operation.

Routes and service of the Municipal Railway bus operation are given in Table I.

Buses of the street car type are used by the Municipal Railway in both feeder and extension service to its railway lines

A statement of the bus line operations for the month of November, 1926, is given herewith. This indicates the method used by the Municipal Railway for setting up the itemized cost per mile for bus operation.

Depreciation on the bus equipment is figured at 2 cents per bus-mile. This is an average figured over the entire equipment, which includes some old buses that have operated in the neighborhood of 300,000 miles and are still used in tripper and extra service. The rate of depreciation is changed monthly so that a fair balance is reached in order to write off the equipment as it wears out.

The detailed description of the bus equipment is given in Table II.

The ten buses purchased by the city are of several types, although all are of White manufacture. All are pay-as-you-enter. There are five TDS buses, weighing 7,800 lb. each, and seating eighteen passengers; two type 20-45 of the same capacity and weight, and three type 50-a, weighing about 10,000 lb. each and seating 25 passengers.

In addition the railway operates three Pierce-Arrow 29-passenger buses which were donated by a community and which are carried in the capital account under contributed surplus at $24,000. The operating expenses, however, are included in the general statement.

Many requests have been made for municipal bus line service connecting with the street cars, and recommendations have been made by M. M. O'Shaughnessy, city engineer, to inaugurate service on five new routes, St. Francis Wood, Balboa Terrace, Westwood Highlands, Westwood Park and the westerly portion of the Sunnyside Tract. All are closely built up portions of the city and are somewhat remote from street railway lines. The contour of the ground is such as to make it costly to construct and operate a street railway, although a bus easily could be operated to connect with the railway. A petition for this bus line signed by 600 residents of these districts was recently presented to the municipal authorities. The proposed route is 1.25 miles long. To provide service for this route an expenditure of $40,000 for equipment would be required.

For almost ten years the matter of transportation for the Potrero Hill District has been under consideration. A new street between Rhode Island and Carolina

TABLE II—BUS LINE OPERATIONS OF MUNICIPAL RAILWAY OF SAN FRANCISCO, NOVEMBER, 1926

Receipts				
Route No. 1 (Tenth Avenue and Fulton to 35th Avenue and Irving)		$2,296.10		
Route No. 2 (Great Highway, Cabrillo to Sloat Boulevard)		1,275.10		
Route No. 3 (Monterey Boulevard Route)		807.65	$4,378.85	
Operating Expenses Group II.—Equipment				
Acct. No.				
39 A–Bus engines, labor and material	$823.96			
39 C–Chassis	370.54			
39 D–Tires, including repairs	882.90			
39 E–Bus body repairs	111.20			
39 F–Labor and material bus repairs due to collisions	4.21			
39 G–Transmission, labor and material, buses	187.93			
39 H–Brake work, labor and material, buses	161.53			
Total Group II		$2,542.27		
Group IV. Conducting Transportation				
78 A–Gasoline, buses	$1,067.81			
78 B–Oil, buses	154.38			
78 C–Conductor-chauffeurs, buses	3,461.40			
78 D–Greasing and servicing, buses	696.93			
78 E–Cleaning and washing, buses	172.89			
Total Group IV		5,553.41		
Group VI. General and Miscellaneous				
88 A–Pension costs, buses	$160.00			
89 A–Administration, buses	50.00			
89 B–Insurance, buses	987.50			
Total Group VI		1,197.50		
Total operating expense			$9,293.18	
Operating loss				$4,914.33
Fixed charges				
Accrued depreciation, 41,146 miles at 2 cents a mile	$822.92			
Interest on investment	245.55			
Garage rental	250.00			
Account No. 215, pro rate of taxes	21.67			
Total fixed charges				1,340.14
Gross excess of expenses over receipts				$6,254.47
Revenue Credits				
6 Q.M. tickets at 5 cents	0.30			
4,935 School tickets at 2½ cents	123.38			
66,092 Local transfers at 2½ cents	1,652.30			
Total revenue credits				1,775.98
Net loss				$4,478.49
Average net loss per day				$149.23

BUS MILEAGE—41.146 MILES. ITEMIZED COST PER MILE

Acct. No.		Acct. No.	
39 A-Bus engines, labor and material	$0.0200	78 C-Conductor-chauffeurs, buses	$0.0841
39 C-Chassis	.0090	78 D-Greasing and servicing, buses	.0169
39 D-Bus tires, including repairs	.0214	78 E-Cleaning and washing, buses	.0042
39 E-Bus body repairs	.0027	88 A-Pension costs, buses	.0039
39 F-Labor and material, bus repairs due to collisions	.0001	89 A-Administration	.0012
39 G-Transmission, labor and material, buses	.0047	89 B-Insurance, buses	.0240
		Garage rental	.0061
39 H-Brake work, labor and material, buses	.0039	215 -Pro rate of taxes	.0005
		Depreciation	.0200
8 A-Gasoline, buses	.0260	Interest on investment	.0060
78 B-Oil	.0037		
		Total expenses	$0.2584
Receipts per bus-mile (revenue credit not included)			$0.1064
Revenue per bus-mile (revenue credit included)			.1496
Total expenses per bus-mile			.2584
Net loss per bus-mile			$0.1088

Buses operated by the Municipal Railway of San Francisco meet rail cars at the line terminals and carry passengers into sections of the city not otherwise served

Streets is now under construction, and when this is completed a bus line connecting with the Potrero Avenue car line of the Municipal Railway is proposed to operate over Seventeenth, San Bruno, Vermont, Twentieth, Twenty-second, and Wisconsin Streets, to 23d Street. The length of this line would be 1.10 miles, and the cost of equipment is estimated at $30,000.

Another recommendation of the city engineer concerns bus service around the waterfront. The length of such a line would be 3.25 miles. The cost of the equipment necessary for its operation would be $60,000. In Lincoln Park the Legion of Honor Building has recently been opened. No direct car service is within easy reach of this building, which is being daily visited by many people. Service would be given by a bus line operating from 33d Avenue and Geary Street, via 34th Avenue and Lincoln Park. The length of this line would be 0.6 mile, the cost of the equipment $10,000.

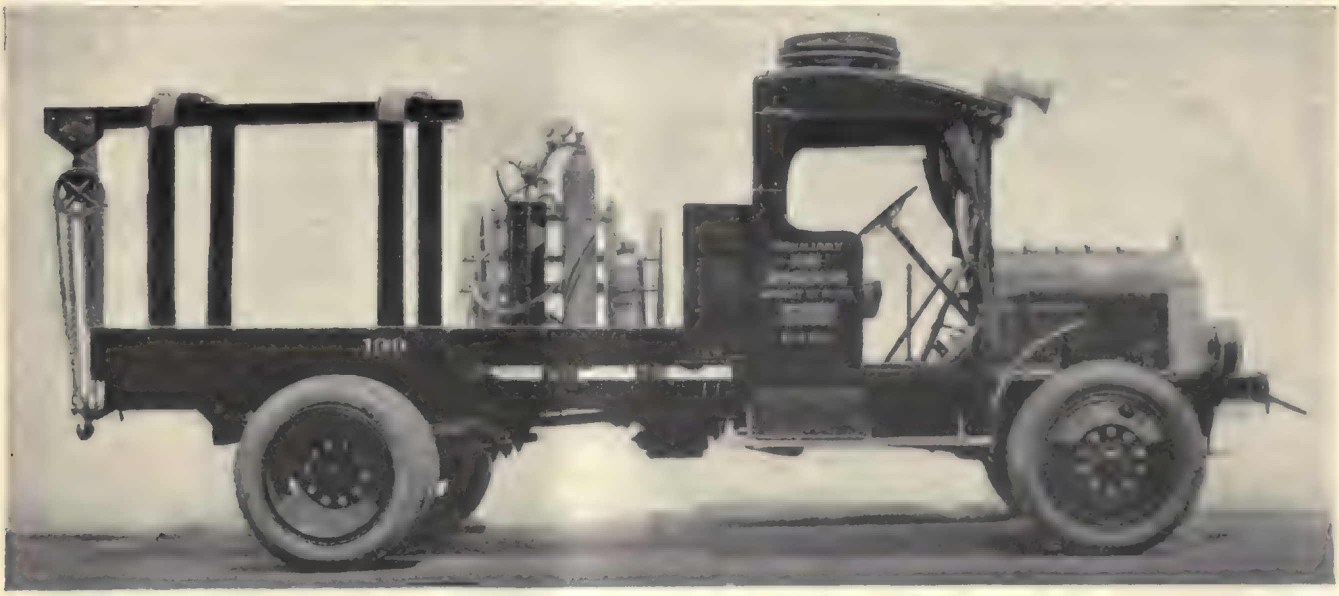
At the present time the vast area lying between Bruno Avenue and Mission Street is without any form of transportation. After the completion of the Excelsior District railway line, as now planned, a bus line would be operated over Silver Avenue from Mission Street to San Bruno Avenue. Its length would be 1.47 miles and the cost of equipment would be $30,000.

Railway Operates Auxiliary Fire Apparatus

VALUABLE service is being given by an auxiliary fire truck built in the shops of the Market Street Railway, San Francisco. It is housed at the Ferry Building and is always on call. Assistance is rendered to the city's Fire Department from time to time. It is equipped with a fire siren and is given the right of way over ordinary street traffic.

From time to time stalled trucks are towed out of the vehicular tunnel, which extends across the foot of Market Street near the ferries. For this purpose the truck is equipped with two drawbars, one at the front and the other at the rear, enabling it to hitch at either end onto a disabled vehicle. The truck also carries a specially built acetylene torch outfit capable of cutting through heavy girders in a few minutes. On the right-hand side of the body is a towing dolly. Over the driver's compartment is a spare tire. Other equipment carried includes fire extinguishers, wire rope, blocks, jacks, etc.

At the rear is a chain hoist capable of lifting a heavy truck. The body is mounted on a Fageol chassis equipped with pneumatic tires.



Emergency truck operated by the Market Street Railway of San Francisco is equipped for fire-fighting and wrecking activities

Car Rebuilt to Resemble Motor Coach

CONFRONTED with the problem of increasing the through riding on the 14-mile interurban line operating between New Bedford and Fall River, the Union Street Railway, New Bedford, Mass., recently remodeled a passenger car to resemble a bus. This company has for some time supplied duplicate service between the two cities, as its New Bedford-Fall River-Providence bus route parallels the electric railway line between New Bedford and Fall River. Each class of service has a 30-minute headway, the car making the run in 60 minutes at a 30-cent fare, while the bus takes 45 minutes, collecting a 50-cent fare. The car makes suburban stops en route, while the bus operates express service from city to city. Because a considerable number of passengers seem to prefer the trolley to the bus, it was thought advisable to encourage this class of patronage by operating a de luxe passenger car.

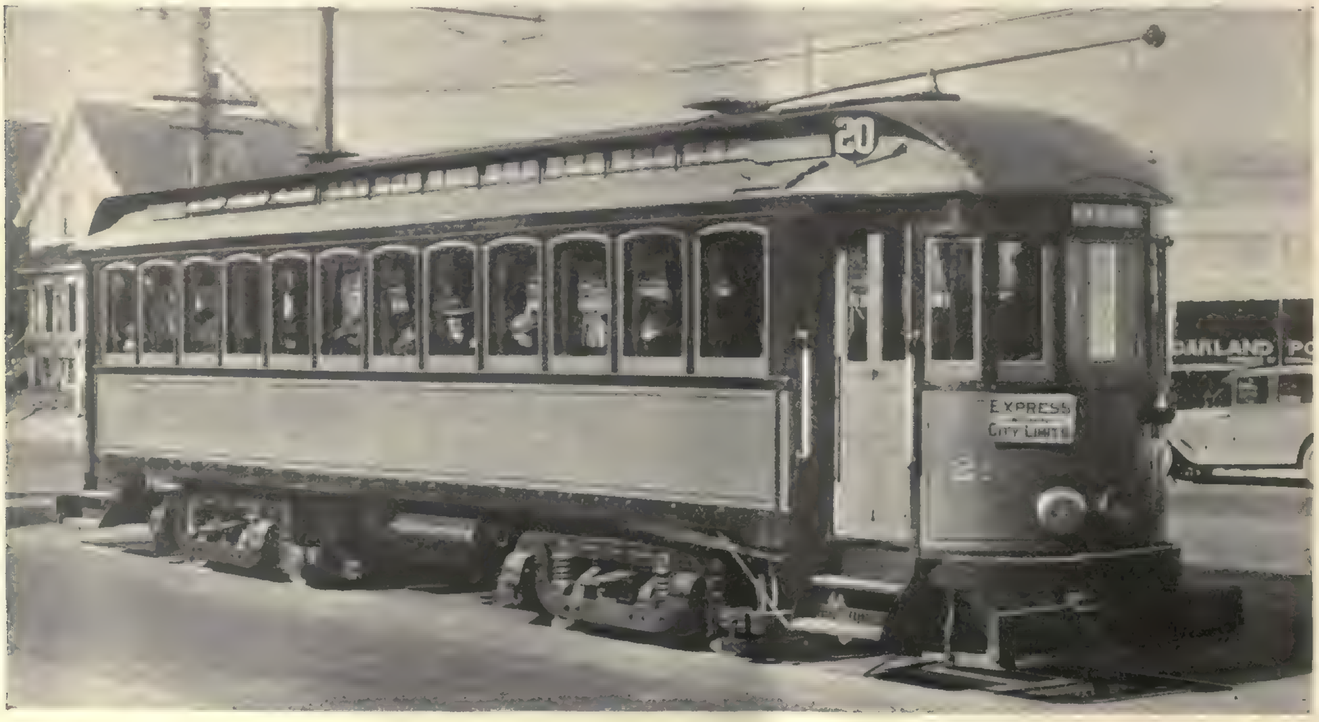
The modern motor coach was used as a model for the interior finish of the de luxe car and it was found that the car presented even more opportunity for finished workmanship than does the motor coach. The existing electrical and mechanical equipment was found to be in excellent condition, making it possible to rebuild the car at a cost of 10 per cent that of new equipment.

Exterior colorings were changed from Pullman green with gold lettering and striping to a tan and brown coloring (Mojave gray and London smoke) with gold lettering and orange striping. Exterior wooden grab handles were replaced by steel pipes, covered with white enamel. Vestibule doors were installed. To give an unobstructed view ahead, the bulkheads at either end of the car were removed and the platforms of the car finished attractively. Battleship linoleum was laid over the old wood floors. Side walls under the windows were covered with a heavy gray tapestry, similar to that customarily used in modern motor coaches. The ordinary street car window curtains were replaced by drapery curtains, held in place by horizontal nickel-plated rods and tie-back snaps. Natural finish ceilings were changed to white enamel with gold striping.

The interior has been refitted along the lines of current automotive practice

Reversible seats are required on this line on account of double-end operation. The seating capacity was not changed, but the rattan covered seats were replaced by air cushion seats, covered with heavy brown leather. Rearrangement of the seats made it possible to build sand boxes in the corners of the car, thus eliminating the necessity of removing a seat top in order to replenish the supply of sand. The lighting system was not changed, although 56-watt lamps replaced 23-watt lamps. The monitor window glasses were changed from amber to white frosted glass, so as to harmonize with the white enameled ceilings.

Only one car has been rebuilt. The success or failure of this piece of equipment will probably aid in determining further developments. The car has not been in service long enough to determine definitely what results will be obtained. A good indication of its popularity is that the company information office is continually asked by patrons what time they will be able to ride on "the de luxe car."



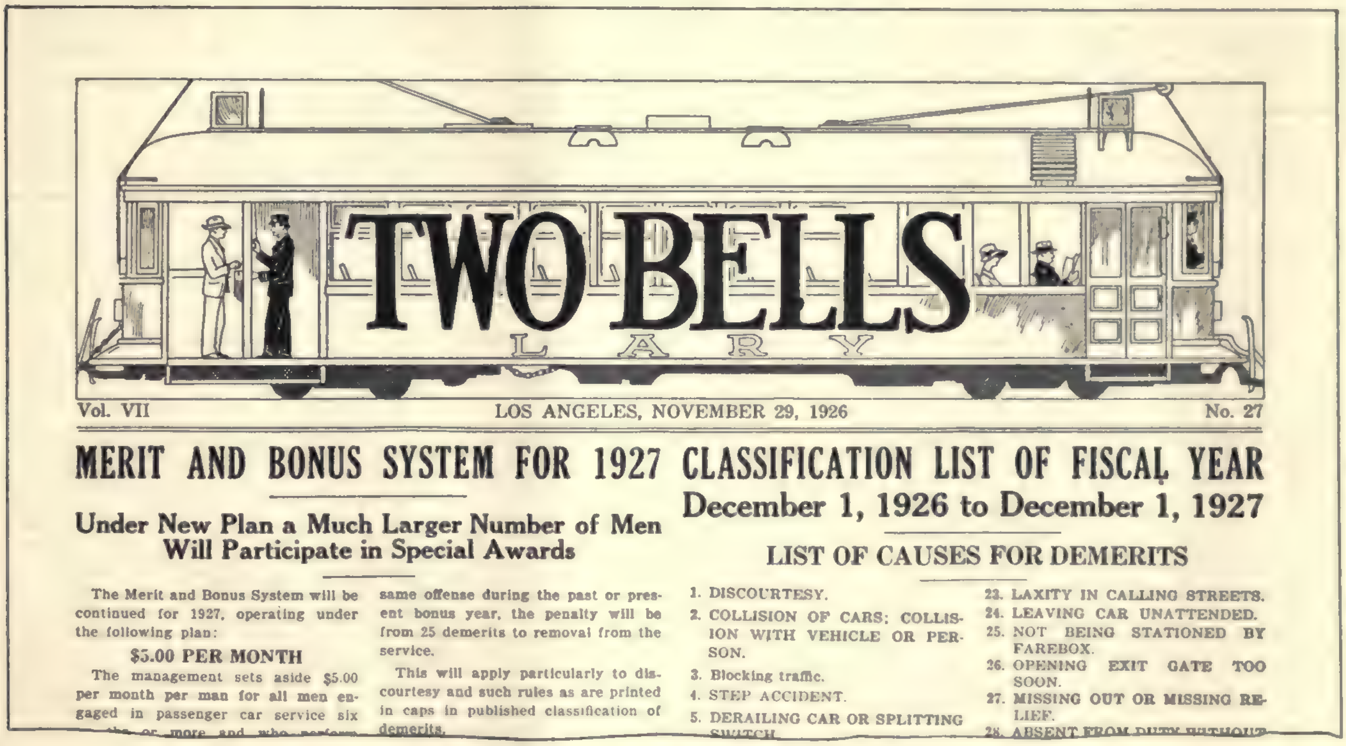
Popularity of this rebuilt interurban car operated by the Union Street Railway on the New Bedford-Fall River route is indicated by the number of inquiries concerning its time of departure

Operating Efficiency Raised Through the Merit System

Systematic administration of discipline, coupled with awards for good records and further bonuses for especially meritorious service, has proved popular with management and men in Los Angeles

IN A CITY where the ratio of population to automobiles is approximately two to one the problems of a street railway property are many. Add to this the difficulty of keeping on an even keel financially with a 5-cent fare and the solution of operating problems becomes more complicated.

Such is the situation in Los Angeles, where the Los Angeles Railway renders extensive city service under conditions far from what would be termed favorable. Efficient performance of shops, equipment and substations and modern track and roadbed have had their collective effect in assisting in the successful operation of the property. However, a large share of the success, according to the management, is attributable to the transportation department—2,700 platform men who on this particular property act as salesmen of transportation. It is this sales effort that has resulted in increased patronage from a public where every other individual is able to ride in an automobile of his own.



TWO BELLS

L A R Y

Vol. VII LOS ANGELES, NOVEMBER 29, 1926 No. 27

MERIT AND BONUS SYSTEM FOR 1927

Under New Plan a Much Larger Number of Men Will Participate in Special Awards

The Merit and Bonus System will be continued for 1927, operating under the following plan:

$5.00 PER MONTH

The management sets aside $5.00 per month per man for all men engaged in passenger car service six

same offense during the past or present bonus year, the penalty will be from 25 demerits to removal from the service.

This will apply particularly to discourtesy and such rules as are printed in caps in published classification of demerits.

CLASSIFICATION LIST OF FISCAL YEAR December 1, 1926 to December 1, 1927

LIST OF CAUSES FOR DEMERITS

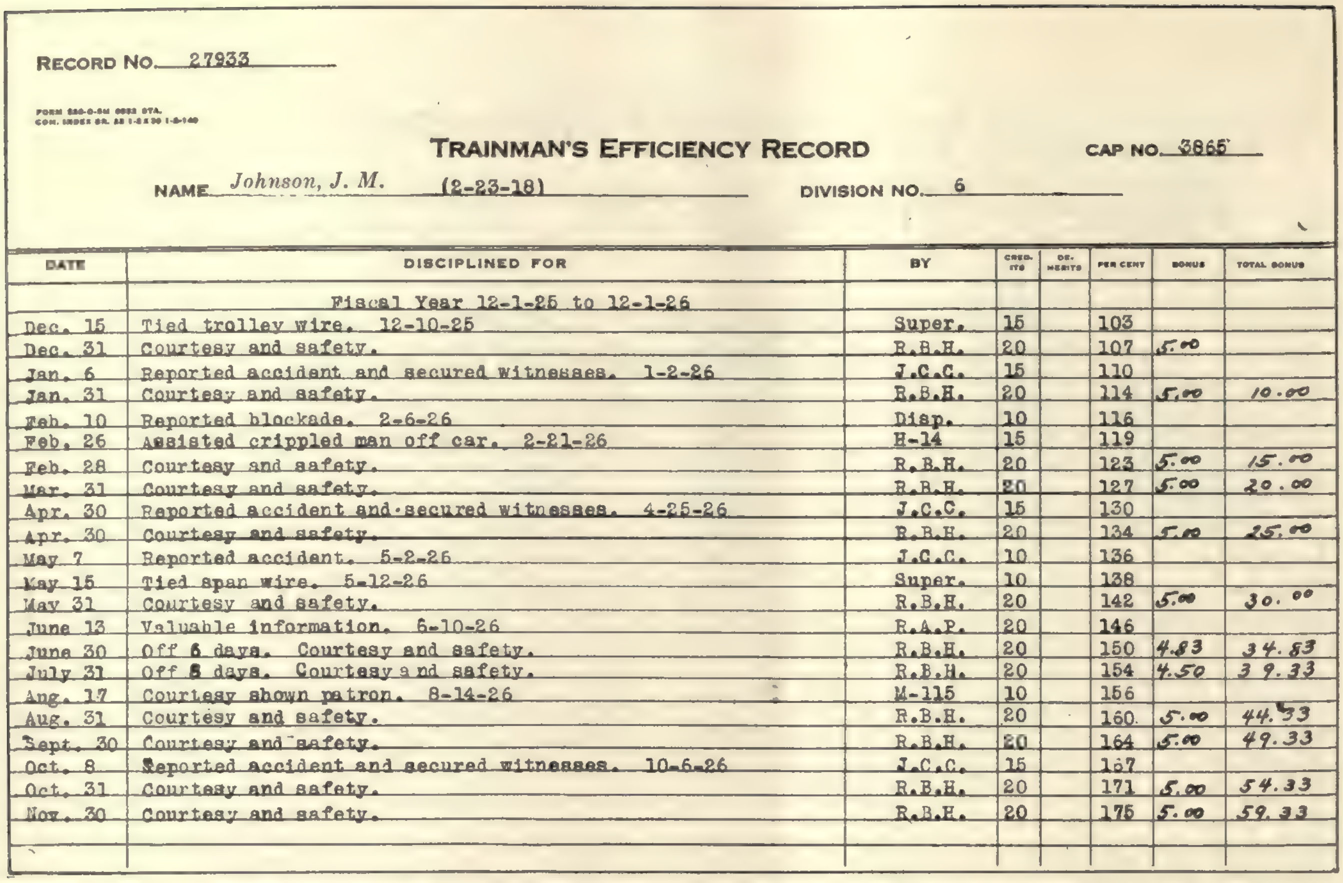
1. DISCOURTESY.
2. COLLISION OF CARS: COLLISION WITH VEHICLE OR PERSON.
3. Blocking traffic.
4. STEP ACCIDENT.
5. DERAILING CAR OR SPLITTING SWITCH

23. LAXITY IN CALLING STREETS.
24. LEAVING CAR UNATTENDED.
25. NOT BEING STATIONED BY FAREBOX.
26. OPENING EXIT GATE TOO SOON.
27. MISSING OUT OR MISSING RELIEF.
28. ABSENT FROM

The successful operation of the Los Angeles Railway is based 90 per cent upon the efficiency of the men who man the cars

Trainmen work under what is known as the merit and bonus system, but which, in effect, is an efficiency plan based upon the principle that a man is rewarded with additional compensation for rendering service which is 100 per cent perfect. A bonus of $5 per month is paid to each man for giving safe and courteous service and a 100 per cent performance. In addition to this $60 a year, those whose records warrant it are entitled to additional awards, the maximum of which for the year 1927 per man will be $40. These additional awards are available to all trainmen who have perfect records, so the bonus for a large number will amount to $100 a year. However, service which is not meritorious is not rewarded, deductions being made from the $5 a month bonus for infraction of rules or established regulations.

In the application of the merit system to this property no attempt has been made to tie it down entirely to the claims department work in the prevention of accidents. Safety is only one of many factors entering into the plan. Courtesy is on a par with safety. It has been the aim of the management in establishing this system to better public relations, thereby gaining good will by improving its own relations with its train-



RECORD NO. 27933

TRAINMAN'S EFFICIENCY RECORD

CAP NO. 3865

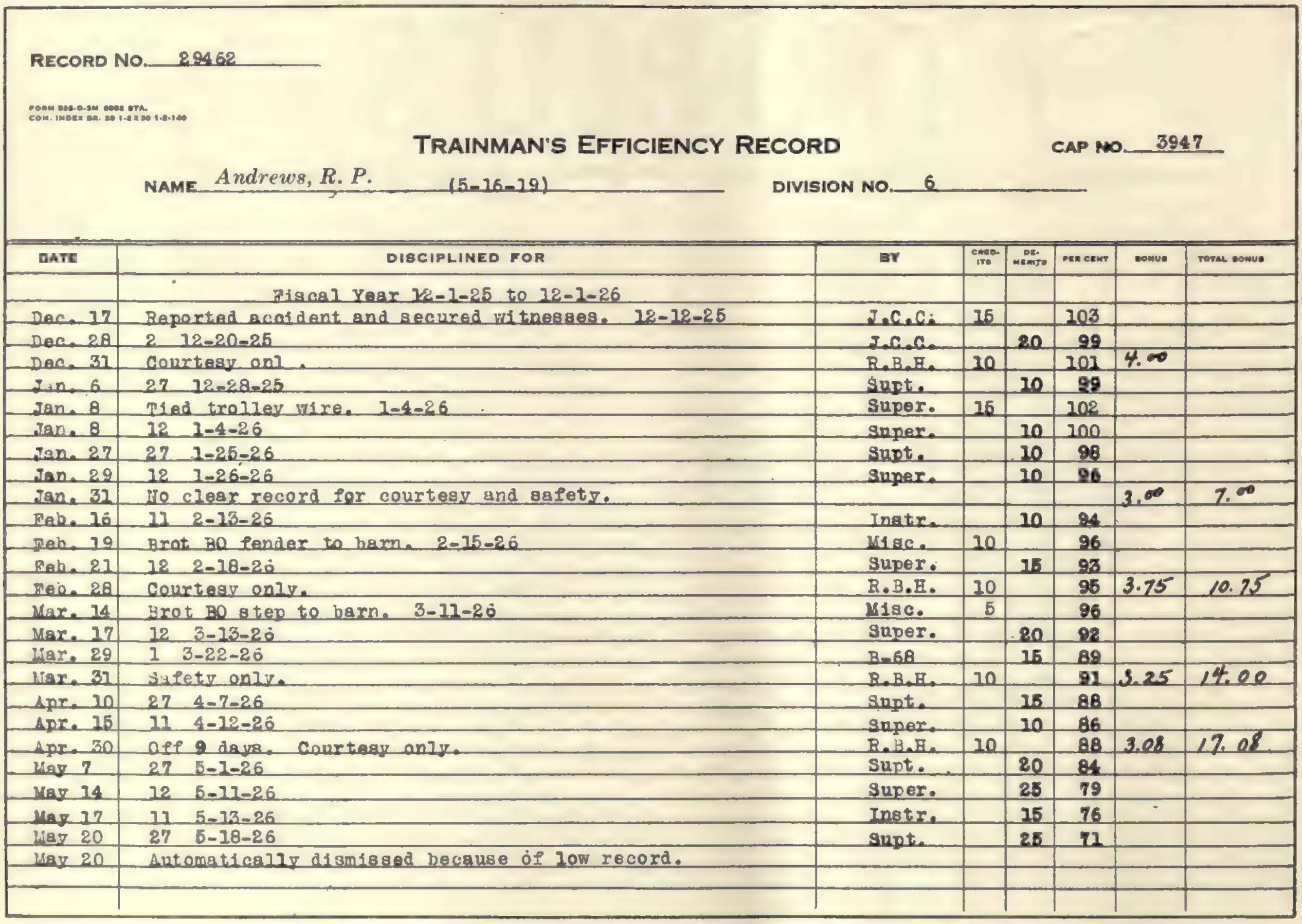
NAME *Johnson, J. M.* (2-23-18)

DIVISION NO. 6

DATE	DISCIPLINED FOR	BY	CREDITS	DEMERITS	PER CENT	BONUS	TOTAL BONUS
	Fiscal Year 12-1-25 to 12-1-26						
Dec. 15	Tied trolley wire. 12-10-25	Super.	15		103		
Dec. 31	Courtesy and safety.	R.B.H.	20		107	5.00	
Jan. 6	Reported accident and secured witnesses. 1-2-26	J.C.C.	15		110		
Jan. 31	Courtesy and safety.	R.B.H.	20		114	5.00	10.00
Feb. 10	Reported blockade. 2-6-26	Disp.	10		116		
Feb. 26	Assisted crippled man off car. 2-21-26	H-14	15		119		
Feb. 28	Courtesy and safety.	R.B.H.	20		123	5.00	15.00
Mar. 31	Courtesy and safety.	R.B.H.	20		127	5.00	20.00
Apr. 30	Reported accident and secured witnesses. 4-25-26	J.C.C.	15		130		
Apr. 30	Courtesy and safety.	R.B.H.	20		134	5.00	25.00
May 7	Reported accident. 5-2-26	J.C.C.	10		136		
May 15	Tied span wire. 5-12-26	Super.	10		138		
May 31	Courtesy and safety.	R.B.H.	20		142	5.00	30.00
June 13	Valuable information. 6-10-26	R.A.P.	20		146		
June 30	Off 6 days. Courtesy and safety.	R.B.H.	20		150	4.83	34.83
July 31	Off 8 days. Courtesy and safety.	R.B.H.	20		154	4.50	39.33
Aug. 17	Courtesy shown patron. 8-14-26	M-115	10		156		
Aug. 31	Courtesy and safety.	R.B.H.	20		160	5.00	44.33
Sept. 30	Courtesy and safety.	R.B.H.	20		164	5.00	49.33
Oct. 8	Reported accident and secured witnesses. 10-6-26	J.C.C.	15		167		
Oct. 31	Courtesy and safety.	R.B.H.	20		171	5.00	54.33
Nov. 30	Courtesy and safety.	R.B.H.	20		175	5.00	59.33

A trainman's efficiency record which is an example of high-class service

It will be noted that the man has been credited with courtesy and safety for each month, and has received additional credit for meritorious service. However, he has been deducted for loss of time, once for one day and once for three days.



RECORD NO. 29462

TRAINMAN'S EFFICIENCY RECORD

CAP NO. 3947

NAME *Andrews, R. P.* (5-16-19)

DIVISION NO. 6

DATE	DISCIPLINED FOR	BY	CREDITS	DEMERITS	PER CENT	BONUS	TOTAL BONUS
	Fiscal Year 12-1-25 to 12-1-26						
Dec. 17	Reported accident and secured witnesses. 12-12-25	J.C.C.	15		103		
Dec. 28	2 12-20-25	J.C.C.		20	99		
Dec. 31	Courtesy onl .	R.B.H.	10		101	4.00	
Jan. 6	27 12-28-25	Supt.		10	99		
Jan. 8	Tied trolley wire. 1-4-26	Super.	15		102		
Jan. 8	12 1-4-26	Super.		10	100		
Jan. 27	27 1-25-26	Supt.		10	98		
Jan. 29	12 1-26-26	Super.		10	96		
Jan. 31	No clear record for courtesy and safety.					3.00	7.00
Feb. 16	11 2-13-26	Instr.		10	94		
Feb. 19	Brot BO fender to barn. 2-15-26	Misc.	10		96		
Feb. 21	12 2-18-26	Super.		15	93		
Feb. 28	Courtesy only.	R.B.H.	10		95	3.75	10.75
Mar. 14	Brot BO step to barn. 3-11-26	Misc.	5		96		
Mar. 17	12 3-13-26	Super.		20	92		
Mar. 29	1 3-22-26	B-68		15	89		
Mar. 31	Safety only.	R.B.H.	10		91	3.25	14.00
Apr. 10	27 4-7-26	Supt.		15	88		
Apr. 15	11 4-12-26	Super.		10	86		
Apr. 30	Off 9 days. Courtesy only.	R.B.H.	10		88	3.08	17.08
May 7	27 5-1-26	Supt.		20	84		
May 14	12 5-11-26	Super.		25	79		
May 17	11 5-13-26	Instr.		15	76		
May 20	27 5-18-26	Supt.		25	71		
May 20	Automatically dismissed because of low record.						

Another trainman's efficiency record, which is an example of inefficiency

Demerits have been given for various offenses which fall under the classification as noted before the date of the offense. The percentage of the man has dropped throughout the year unitl he was automatically dismissed because of low record, his record having dropped below 75 per cent. His bonus for this period would have been $17.08, as against a possible $30. The names of employees and their cap numbers given above are fictitious, as they are for illustration only.

men. This effort has resulted in a personnel of satisfied salesmen.

To the company this system means an extra annual expenditure of approximately $125,000. The return from this expenditure cannot be measured exactly. However, one factor stands out above all others. It is recognized by those familiar with both the operating and financial status of the company, namely, that the good will of the public obtained through courteous service on the part of the trainmen has resulted in increased riding. This has made possible the operation of the lines on a 5-cent fare. Another tangible result of the system has been the noticeable reduction in accidents and also the reduction in claims. The first is attributable to safe operation, the second to the establishment of better public relations.

From the time a man enters the service of the transportation department a record is kept of his efficiency. This record card is made out annually by the merit department. It determines whether a man is entitled to the full bonus for each month or a portion of it.

Efficiency record cards are kept in the department office and filled out monthly, or at such time as the man receives a demerit or credit for his efficient or inefficient service. If entitled to it, the trainman also receives credit at the end of each month for safe and courteous operation. The award of credits or the allocation of demerits, with the exception of fixed cases where the case itself determines, and the number to be awarded or subtracted are in the hands of the supervisor of merits. This arrangement has proved more satisfactory than the previous arrangement whereby the division superintendent made the award or gave a demerit.

CAUSES FOR DEMERITS

A list of demerits has been set up by the department and contains 40 classifications, under any one of which a trainman may receive demerits. Each man is judged separately as to whether he is entitled to credit or demerit. Inefficient operation on the part of the motorman does not necessarily affect the record of the conductor. The same holds true in regard to the motorman's record. The accompanying list of causes for demerit has been set up under the 1927 plan.

It will be noted that some classifications of demerit have more prominence in the table than others. Under the rules for the ensuing year, where it is found necessary to assess demerits against a man who has been previously demerited for the same offense during the past or present bonus year, the penalty will be from 25 demerits to removal from service. This will apply particularly to disregard of such rules as are printed in heavy type in the classification. Demerits are assessed on recommendation of division superintendents, supervisors, instructors, safety men and others in authority. All reports on which demerits are based are checked in the main office by the supervisor of the merit system before being entered on the record and forwarded to the division superintendent.

Deductions from the bonus are made at the rate of 25 cents for each five demerits assessed (five demerits equal 1 per cent), regardless of previous efficiency as shown on the record. When a man's efficiency rating drops below 75 per cent he is subject to automatic dismissal from the service. However, dismissal from service for other offenses may be made regardless of the efficiency rating.

Ten credits are allowed each month for a clear courtesy record and ten credits for a clear accident record. As was previously stated, these credits are given automatically.

Demerits are canceled from a man's record only in case of an error in report or extenuating circumstances, which must be explained to the satisfaction of the supervisor of the merit system. Appeals from demerits assessed must be made within 30 days, first to the division superintendent and second to the supervisor of the merit system.

To establish a man's efficiency rating, which is upon a percentage basis, each five credits or demerits counts for 1 per cent. Thus, if a man's record is perfect for the month for both courtesy and safety and he has received neither demerits nor credits his efficiency rating would be raised 4 per cent. At the end of a year his efficiency record should be 148 per cent. With the possibility of a 148 per cent rating for courtesy and safe operation, the figure 75 per cent, which is about one-half of this amount, should warrant dismissal from the service.

Each year since the inauguration of the merit and bonus system, in 1920, there has been a gradual tightening up on the men, a stricter enforcing of discipline and the subsequent changing of the number of demerits

Classification List for Fiscal Year Dec. 1, 1926, to Dec. 1, 1927

LIST OF CAUSES FOR DEMERITS

1. **Discourtesy.**
2. **Collision of cars; collision with vehicle or person.**
3. Blocking traffic.
4. **Step accident.**
5. **Derailing car or splitting switch.**
6. Bending or breaking trolley pole, or operating against same.
7. Carrying passengers past destination.
8. Passing up passengers.
9. **Failing to report accident.**
10. **Doubling electric switch.**
11. **Excessive speed.**
12. **Running ahead of time.**
13. **Dangerous operation.**
14. Errors on cards and trip sheets.
15. **Remaining seated while passengers boarded or alighted.**
16. Failing to have watch inspected.
17. **Giving bells too soon, or with back to steps.**
18. Going against traffic signal.
19. **Failing to make safety stop.**
20. **Leaving terminal late.**

*21. Improper operation or flagging at railroad crossing. (Special rule).

22. Improperly equipping car. (Dash sign, T. R. No., or lights).
23. **Laxity in calling streets.**
24. **Leaving car unattended.**
25. **Not being stationed by farebox.**
26. **Opening exit gate too soon.**
27. **Missing out or missing relief.**
28. **Absent from duty without permission.**
29. Reading newspaper.
30. **Starting car too soon, or without bells.**
31. **Violating road space.**
32. Smoking while on car.
33. **Remaining seated on stool in zone 1.**
34. **Failing to sound gong at dangerous street or when starting up.**
35. **Visiting with motorman or riding front section.**
36. **Improper feeding of controller, or abusing equipment.**
37. **Wasting power.**
38. Failing to report accident or delay promptly or to dispatcher.
39. Unnecessary conversation.
40. Miscellaneous.

CREDITS

No classifications.

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*Note: Penalty for same: Sent to instruction department one day without pay.

given for certain offenses. Now a high percentage rating does not prevent a man from losing part of his bonus for being demerited during the month. Thus the illustration of the efficiency record card of R. P. Andrews shows that he received only $4 of his bonus for the month of December, the first month in the fiscal year of the bonus plan. He received twenty demerits during the month, which amounted to $1. In addition to the standing credit for courtesy and safety, there is also a standard demerit for loss of time. This amounts to 16⅔ cents for each day out of service over the five per month allowed each man. This deduction in bonus is not recorded as so many demerits on the efficiency record. It does not affect the percentage standing.

Los Angeles Railway

1. The following three examples give the leaving time at the terminals and the number of minutes running time between intermediate time points. In each case, what time would you arrive at the other end of the line?

Leaving at 9:53 a.m. Min.	Leaving at 10:59 a.m. Min.	Leaving 11:43½ p.m. Min.
7	9½	7½
8½	8	4½
9½	5½	9½
11½	7½	7
7½	13½	8½
9	8	15½
...	9½	7½
Arrive at..........	Arrive at..........	Arrive at..........

2. If you started to work at 7:59 a.m., and were relieved at 1:53 p.m., and resumed duty again at 2:39 p.m., and completed your run at 6:29 p.m., how much time would you put down on your trip sheet for the entire day's work?

Answer..............hours..........minutes.

3. If you started to work at 6:27 a.m., and were relieved at 9:19 a.m., and resumed duty again at 10:47 a.m., and were relieved at 12:07 p.m., and started the last portion of your run at 3:57 p.m., and completed same at 7:11 p.m., how much time would you put down on your trip sheet for the entire day's work?

Answer............hours............minutes.

4. Add the following two problems:

9839	796
784	3957
977	486
7459	9758
585	945

5. Subtract the following four problems:

79381	93775	71005	50738
68493	92887	70996	49849

6. Multiply the following five problems:

9397	8995	4807	69387	7698
5	7	9	5	9

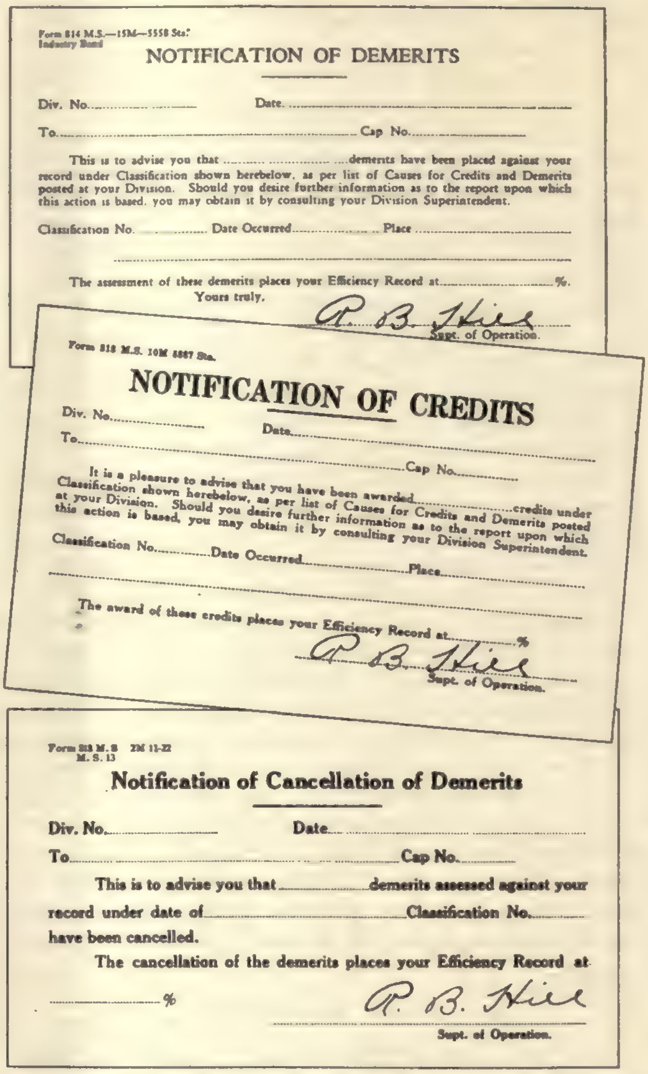
7. Divide the following four problems:

5)19790 5)9330 5)87505 5)3795

Date............19.... Signed..................................
Applicant.

Typical examination form used

In addition to the regular bonus, special awards have been given each year for particularly good service. During the year 1927 two classes of awards will be made. The first class gives an additional award of $40 to all men in active passenger service who have not lost more than 60 days time during the year, who have clear courtesy accident records and who have received no demerits. The second award gives an additional award of $20 to all men who have not lost more than 60 days time, who have clear courtesy and accident records, who have not been demerited more than three times and with no repetition under any one classification, and who have received no demerits for infraction of rules under the classifications printed in large type in the accompanying list. With these awards and the regular bonus, the company expects to spend during the next fiscal year of the bonus approximately $125,000 on the system. The bonus is credited monthly to the record and paid on the Dec. 15 for the previous fiscal year ending Dec. 1. If a man loses his job or leaves the company he automatically loses his bonus. Also a man does not participate in the bonus until he has been in the service of the company six months, a three months probation period being counted in this six months.



Form 814 M.S.—15M—5558 Sta.
Industry Bond

NOTIFICATION OF DEMERITS

Div. No.............. Date..............

To.............................Cap No..............

This is to advise you that ....demerits have been placed against your record under Classification shown herebelow, as per list of Causes for Credits and Demerits posted at your Division. Should you desire further information as to the report upon which this action is based, you may obtain it by consulting your Division Superintendent.

Classification No.......... Date Occurred.............. Place..............

The assessment of these demerits places your Efficiency Record at..............%.

Yours truly,

R. B. Hill
Supt. of Operation.

Form 818 M.S. 10M 4887 Sta.

NOTIFICATION OF CREDITS

Div. No.............. Date..............

To.............................Cap No..............

It is a pleasure to advise that you have been awarded..............credits under Classification shown herebelow, as per list of Causes for Credits and Demerits posted at your Division. Should you desire further information as to the report upon which this action is based, you may obtain it by consulting your Division Superintendent.

Classification No..........Date Occurred..............Place..............

The award of these credits places your Efficiency Record at..........%

R. B. Hill
Supt. of Operation.

Form 813 M.S 2M 11-22
M.S. 13

Notification of Cancellation of Demerits

Div. No.............. Date..............

To.............................Cap No..............

This is to advise you that..............demerits assessed against your record under date of..............Classification No.......... have been cancelled.

The cancellation of the demerits places your Efficiency Record at ....%

R. B. Hill
Supt. of Operation.

Notification is sent to each trainman on these forms as to demerits or credits or the cancellation of demerits

In 1921, out of 2,150 trainmen, 1,977 received the full bonus or a portion of it and 77 of these received extra awards. These extra awards consisted of a double bonus for the motorman and conductor of each of the five divisions whose standings were the highest, with additional special prizes of $25 for each of the second men, fifteen for the third and four additional prizes of ten dollars each as separate prizes for one-man car operators.

In 1922, out of the 2,350 trainmen, 1,930 received a full or portion of the bonus and 110 of the high men at the various divisions received special prizes aggregating about $4,000. The highest conductor and motorman in each division received $60, the next $25, the third $15 and four other prizes of $10 each.

In 1923 approximately $100,000 in bonus money was distributed to approximately 2,500 trainmen out of the 2,700 trainmen in the service. Special prizes were awarded to 110 of the top men. In 1924 2,330 trainmen participated in the bonus and received $106,000. New high records were established as regards the number of men participating and in the amounts paid. In 1925 2,208 trainmen participated in the bonus and received $110,000.

In 1926 the plan of awards was slightly changed to avoid a condition which experience showed to exist. Under the original merit system the $5 monthly bonus was paid to each trainman unless he was demerited or penalized for lost time, so that if his efficiency rating was 100 per cent or over and if he was not penalized for lost time he would receive the full bonus of $5 a month. Under this plan a man whose rating was 120 per cent might receive 50 demerits, which would lower his efficiency rating to 110 per cent, without affecting his bonus, as the bonus was affected only when his efficiency rating dropped below 100 per cent. In the plan now in force, when a man receives demerits, regardless of his efficiency rating, he loses 25 cents for each per cent deducted at the time demerits are assessed.

In 1926, in addition to the regular $60 a year bonus, special awards ranging from $10 to $100 were made to the ten top motormen, to the ten top conductors of each of the five divisions and to the ten top safety car operators. These prizes are divided as follows: There is one of $100, one of $75, one of $60, one of $40, one of $25, one of $15 and four of $10 each. These special awards went to 110 men. The absence of demerits and the amount of time worked were factors considered in picking these men. Mere accumulation of credits did not come in for any great amount of consideration as each man automatically received ten credits each month for a clear safety record, as well as ten credits for a clear courtesy record. This same method of picking men for special award is in effect for the fiscal year of 1927, but under an arrangement by which the highest man will receive only $40 instead of $100. However, there is a greater spread of special award money for the ensuing year and more awards will be made.

HOW DEMERITS OR CREDITS ARE GIVEN

In checking trainmen, supervisors and inspectors exhaust every possible effort to correct deficiency before recommending demerits. If they find they cannot handle the case without recommending demerits they report the fact to the supervisor of the merit system, who determines the number of demerits to be assessed for such violation and has the necessary entry made on the man's record. In most cases a man receives ten demerits for the first offense, ten for the second, fifteen for the third, twenty for the fourth, etc. When a man's rating drops to 90 per cent a personal letter is sent to him or he is asked to call at the office so that the supervisor of the merit system may go over his record with him. He is given to understand that he must discontinue violating the company rules if he expects to remain in the service.

Reports of trainmen's operating efficiency are made directly to the supervisor of the merit system. They come in on various forms, depending upon their origin. However, the responsibility for making the award of merits or demerits rests on the supervisor of the merit system. When his decision is reached, a notification slip is sent to the trainman, a blue slip advising him of demerits and a pink slip of credits. At this time the entry is made on the man's efficiency record card and his percentage worked out to include the particular demerit or credit.

On the efficiency record the credits are entered in black figures, the demerits in red and the percentage column in black, 100 per cent or over, and below this in red. This enables the supervisor to glance at a man's record card and tell at once whether he has been repeatedly demerited.

The merit system has succeeded far beyond the early anticipations of the company and after six years neither the higher officials nor the supervisors could be prevailed upon to abandon it, nor would the trainmen themselves give their consent if they had their choice. During the fiscal year 1924-25 the company adopted the policy of automatic cancellation. Under this plan, after the man had been demerited for violation of some rule, if he did not repeat the violation for a period of 90 days the demerits would automatically cancel themselves. After working this plan for a short time, it was found unsatisfactory. The merit system was originated and placed in operation by George Baker Anderson, manager of transportation, and is now under the direct supervision of R. A. Pierson, who reports to R. B. Hill, superintendent of operation.

Questionnaire

Motormen

Motormen will fill in answers to the questions given below on the reverse of this sheet, using additional paper if necessary, and numbering same to correspond to the question, and will turn the completed sheet in, signed with name, cap number and division, to the division foreman not later than April 24.

Motormen failing to give correct answers will be called in for additional instruction.

No. 1. What is required of a motorman when using group movement from the third position?

No. 2. What is required of a motorman when railroad crossings are being flagged?

No. 3. What is the rule in regard to backing up, and how can you signal your conductor when wishing to back up a short distance?

No. 4. What does a plain yellow sign, or one with a black cross on same, indicate when suspended from span wire?

No. 5. When power is off, are cars to be allowed to coast down grade, and if not, why? And what cars start first after the power has been off?

No. 6. Under what conditions may passengers be passed up, and what precautions must be taken when doing so?

No. 7. Are cars allowed to group over electric switches, or double in opposite directions over same?

No. 8. What is the road space rule when operating in Zone No. 2, and why should a motorman so operate his car as to avoid having to make the 100-ft. stop?

No. 9. Mention five things which a motorman must not do while the car is in motion.

No. 10. At what speed should a car be operated, and what precaution should be taken when unloading newspapers?

No. 11. Is it permissible to pull a car in over the pits while passengers are still on board?

No. 12. Who is responsible for knowing that all necessary dash signs are on the car before pulling out?

R. B. HILL,
Superintendent of Operation.

Carpenter Shop Waste Disposal Plant

Shavings and Sawdust Are Conducted Directly to an Incinerator, Where They Are Disposed of Speedily and with No Excess Labor

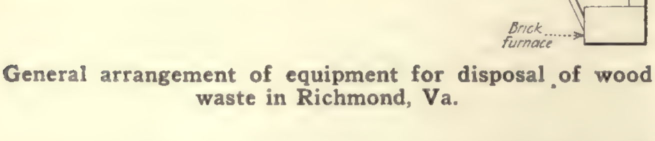
EQUIPMENT for the automatic removal of sawdust and shavings from the various wood-working machines to an incinerator is a feature of the carpenter shop of the Virginia Electric & Power Company, Richmond, Va.

A 36-in. Sturtevant blower erected on a solid foundation about 15 ft. above the carpenter shop floor is driven by a belt from a near-by line shaft. A 12-in. galvanized pipe connected to the intake of this blower extends longitudinally through the shop. A 6-in. galvanized pipe leads to the 12-in. pipe directly from each sawdust or shaving forming machine from which the refuse is to be collected. One end of the 12-in. galvanized pipe is connected to the outlet side of the blower and the other end is fastened to the top of a conical hopper erected in the yard directly back of the shop.

A 6-in. galvanized pipe connected to the bottom of this hopper extends downward at an angle of about 45 deg. and enters the firebox of a brick furnace erected about 15 ft. distant.

Immediately after its formation waste material is drawn up through the 6-in. pipe by the fan intake into the 12-in. pipe connected to the intake side of the blower. From here it continues on, passes through the blower fan blades, is blown through the 12-in. pipe connected with the outlet side of the fan and is deposited into the hopper in the yard. The waste swirls around inside of the hopper, drops to its bottom and passes out through the 6-in. pipe, finally falling into the firebox, where it is burned.

The pipes and hopper are made of No. 16 galvanized iron. Careful riveting and soldering of all joints provides an airtight line. The blower air is exhausted through a fine-mesh screened opening in the top of the hopper, which has an over-all depth of 9 ft. and a maximum diameter of 6 ft. The depth of the cylindrical portion above the supporting frame belt is 3 ft.



General arrangement of equipment for disposal of wood waste in Richmond, Va.

The furnace is built of ordinary red brick. Its outside base is 6 ft. x 6 ft. and the firebox is 5 ft. x 4 ft. x 4 ft. Above the firebox the base tapers down to 30 in. x 30 in. for the formation of the chimney. A damper in the chimney permits of draft regulation. The firebox is provided with an iron grate. Both the firebox and ash compartment are inclosed by heavy iron doors.

Tower, conical hopper, brick furnace and waste pipes used for wood refuse disposal in the Richmond, Va., shop of the Virginia Electric & Power Company

The tower uprights for the support of the conical hopper consist of 50-lb. T-rail imbedded in a concrete foundation. These four T-rails are bound together at the top by a 6-in. angle frame. The reinforcement is made of 2-in. angles. The supporting cradle for the conical reservoir is made of ½-in. x 3-in. bar iron. All of the framing is carefully designed and riveted securely together.

This incinerator not only disposes of the carpenter shop refuse material, but of practically all inflammable waste collected throughout the shop and grounds. It has provided a means for maintaining a neat and clean carpenter shop appearance and has eliminated the necessity of constantly removing the rapidly accumulating waste by hand, thereby effecting a substantial saving in labor. The danger of fire has been reduced by the immediate disposal and burning up of the waste material.

Alarm Clocks for Bus Patrons

BUS patrons of the San Antonio Public Service Company, San Antonio, Tex., are pleased with an ingenious device installed at one of the company's loading stations for showing the time their next bus will arrive. An alarm clock with illuminated dial has been placed in the center of a square piece of cardboard on which are printed the names of the different lines, showing the time the next bus will arrive. For example, if a bus leaves the station every twenty minutes starting on the hour, then the name of that bus line is printed above the figure "12" on the clock, next to the figure "4" and the figure "8." Similar names printed around the face of the clock show the time each bus leaves, and a glance at the clock shows the patron how long it will be before another bus on that line is due. This practice has proved very popular with the patrons. Women who have one or two purchases to make are able to see by the clock that they still have a few minutes and are thus assured of making their purchases without missing their bus. The arrangement is simple and inexpensive, yet it is a point of service which cannot be readily overlooked.

The Readers' Forum

The Glory that Is Rome's

NEW YORK, June 2, 1927.

To the Editor:

Methods of transportation used in the Eternal City were brought home forcefully to me by the article in the JOURNAL for May 28. Many of the practices reviewed therein contain nothing new to the sophisticated European traveler, but not many men in America are foreign travelers or sophisticated when it comes to things European. For that very reason the account should be of the greatest interest to American readers. Not only that, but throughout the story there was just the touch of local atmosphere imbibed by the observer on the spot that was needed to convey the reasons for some of the differences between American and European practices.

Of course the main transportation problem, that of getting vehicles through the central district quickly, is the same here as it is abroad, but the difference in habits of the continental injects the elements that make for dissimilarity of detail. Consider the matter of peak loads! The taking of two hours for lunch is not unusual among American business men, but it does not extend to the rank and file here. Moreover, the noonday recess in American cities is not attendant with the formality that attaches to the process in Europe. Appreciation of the pomp and circumstance which attend this European noonday shutdown are essential to the American if he is to understand fully the differences in the peaks of riding which this leisurely practice introduces as a problem to the European operating executive. But this is only one of many things. The reference to the rarity of the traffic policeman in Rome is also another touch of local color, just as is the observation that motor traffic in Rome shuns the streets on which there are car tracks. It is interesting to reiterate that the present independent bus service is routed over streets that do not contemplate the ascension of any of the seven hills on which the city is built. That work is left for the trolley.

It is nothing new, of course, to know that the selling of the tramway service has long been a factor in the scheme of things of the tramway management at Rome, but the extent to which the process has been carried must have come as a revelation to many American readers. Particularly wise have the Latins been in so arranging the "tramway guide" that it is sold, rather than given away, for it is a notorious fact that human nature takes lightly the things that are free. Technically, of course, the American trainman may have the right to refuse admittance to the passenger who does not proffer the exact fare, but it must seem a little strange to the American operator to observe that it has been made plain to the riders of Rome that the trainman "has the right to refuse admittance to the car to all persons who do not present the exact fee."

The account of railway operation in Rome as set down in the JOURNAL was most interesting. It all goes to show, as the writer in the JOURNAL intimated, that transportation men the world over are kin and that dependable transportation is essential much of the time to the colonel and his lady and all of the time to Mr. and Mrs. O'Grady.

J. G. RAYMUR.

Performance Figures on Great Northern Oil-Electric Locomotive

PERSONS interested in the performance of oil-electric units will welcome the following figures compiled by the Great Northern Railway on its oil-electric locomotive No. 5100, now in switching service at Minneapolis. The compilations, furnished through the courtesy of W. R. Mills, general advertising agent at St. Paul, Minn., cover April, 1927. The engine was in service 575 hours at 6 m.p.h. and traveled 3,450 miles.

REPAIRS		
Labor		$177.64
Material		71.95
Total cost of repairs		$249.59
Cost of fuel oil 5,740 gal. at 3 cents per gallon		172.20
Cost of lubricating oil		53.79
Cost of miscellaneous supplies		3.26
Engine house expense, thirteen handlings at $4.184		54.40
Enginemen's wages:		
Engineers	$541.95	
Firemen	409.65	
Total		951.60
Total		$1,484.84
COSTS IN CENTS PER MILE TO RUN OIL-ELECTRIC ENGINE:		
Repairs		7.23
Fuel		5.00
Engine house expenses		1.58
Lubridants		1.56
Other supplies		.09
Wages		27.58
Total		43.04

The following comparison may also be interesting:

	Oil-Electric Engine	Eight-Wheel Switch Engine
Tractive power	60,000	58,500
Weight on drivers	209,500	232,600
Total weight engine and tender	209,500	375,500
Weight on drivers to T. P.	3.47	3.98
Superheated		Yes

Windshields Kept Free of Frost

Hot air dries windshield

WINDSHIELDS of the interurban buses operated by the Indiana-Columbus Eastern Traction Company are kept free of frost by a small stream of hot air from the engine. The illustration shows a flexible metallic tube carried out over the exhaust manifold, through which the heated air is conducted to a flat-edged nozzle, so that it blows on the inside of the windshield, keeping it just warm enough to prevent the formation of frost or mist in any weather. This simple device, made in the shops of the company, has been used on practically all of the buses throughout the past winter. These buses operate between Dayton, Springfield and Columbus, a distance of 52 miles, at 30 to 35 m.p.h.

Maintenance Notes

Line Construction Car Mounted Astride Body

FINDING it impossible to purchase a line construction motor truck embodying certain desired features led the Harrisburg Railways, Harrisburg, Pa., to purchase an International Harvester Company's Model 60 chassis and design and build a body for it.

The body is of the totally inclosed type, ruggedly built of well-seasoned oak, rigidly reinforced and bolted securely to the chassis. In the design the thought constantly kept in mind was to make a body as strong as possible and at the same time be able to utilize the entire inside for the storage of materials and tools and the transportation of the working force. As a result a radical departure was adopted in that the tower was erected astride the body.

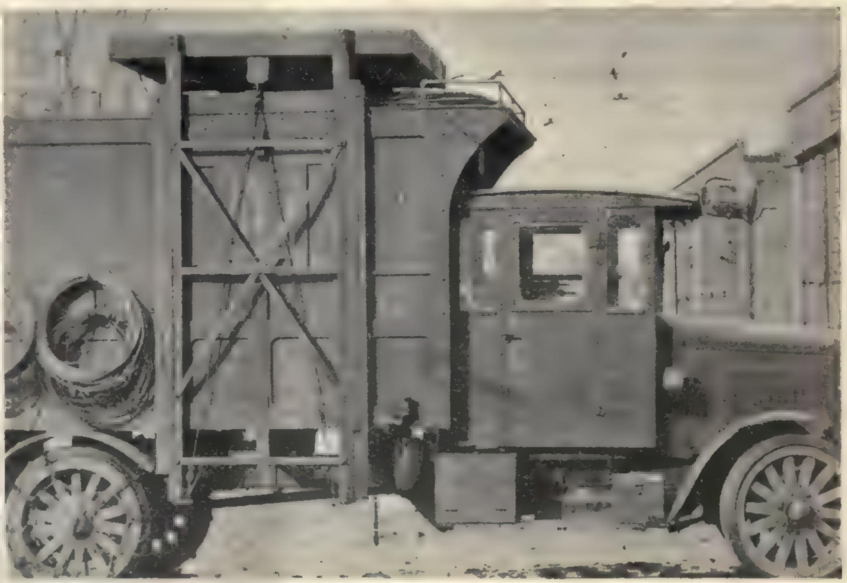
The tower is constructed of heavy oak timbers, rigidly braced and held in position by suitable channel girders bolted to the sides of the body. An added feature consists of a collapsible safety railing installed on the outside edges of the tower platform. The hinges, bolts and hooks are placed so as to permit of quick erection or collapse. When folded the rail rests on the platform.

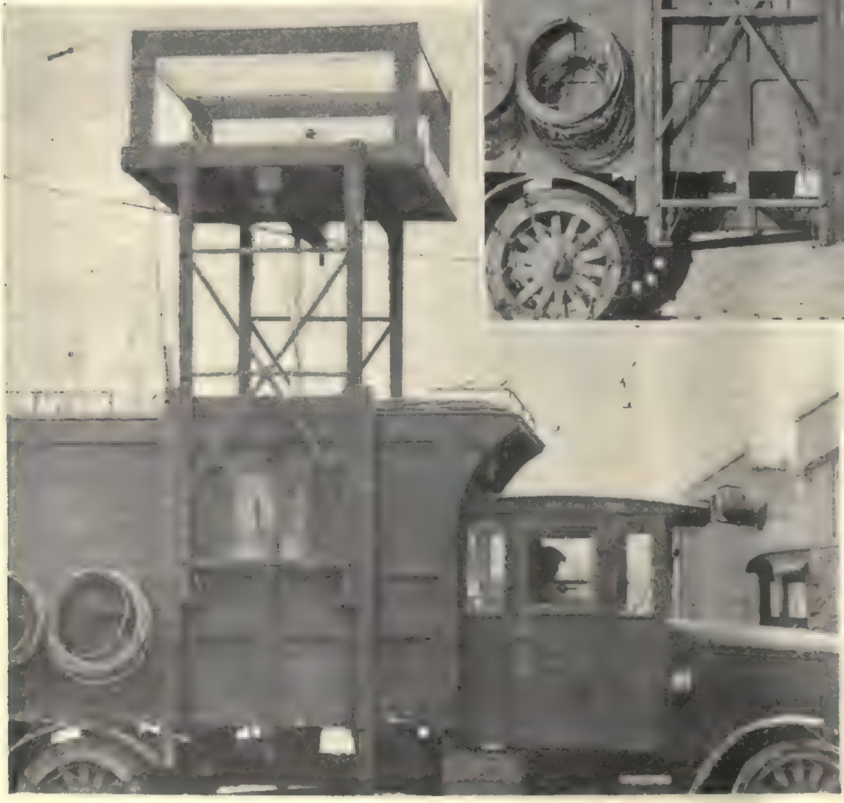
Raising and lowering of the tower are accomplished by means of high-pressure oil. The high-pressure pump connected to the engine propeller shaft pumps oil from an 8-in.x12-in. oil storage reservoir into a 3-in. cylinder, the piston of which is attached to the center of the tower platform. Starting and stopping of this pump and release of the pressure are controlled by levers located in the driver's cab. The quantity of oil contained in the storage tank is just sufficient to raise the tower to the predetermined maximum height. As an additional safeguard, to eliminate the possibility of the tower being raised to such a height as to endanger the men or to leave the guides, a set of fingers is installed which will shut down the engine by short circuiting the spark when the danger point is reached. The fingers are attached to the truck body at the roof and a contact plate on the center portion of the movable framework produces the short circuit.

Metal baskets on top and hooks on the sides of the body permit of the carrying of additional material when required. The weight of the truck is 8,000 lb. It has a capacity of 6,000 lb. and is painted in colors blending with those used on the cars.

At right, line construction truck with tower and safety railing down

Below, line construction truck of Harrisburg Railways with tower raised and safety railing up



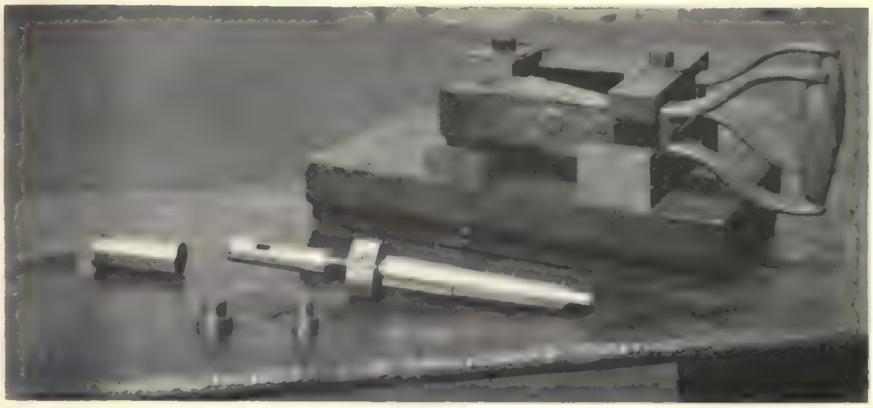


Adjustable Tool for Finishing Inaccessible Faces

BRAKE handles used on the rapid transit cars of the Brooklyn-Manhattan Transit Corporation have four parallel faces to be finished on the bosses. Two of these are inside a cored portion so that an ordinary finishing tool cannot be employed. The tool developed for the purpose consists of a tapered shank, a cutting bit and a clamping sleeve. The shank has a threaded section in the center on which a knurled collar screws. The bottom end has two rectangular openings for inserting cutting tools. The second part of the tool consists of a sleeve which fits over the bottom portion of the shank. This has notches at one end so that when the cutting bit, which is the third part of the device, is inserted through one of the rectangular holes in the shank, the sleeve can be forced down against the bit by turning the knurled collar, and the notched portion fits over the cutting tool to hold it securely.

For the finishing work, two handles are placed in a special jig. When the handles are rights and lefts one of each kind is used. When the handles are of the same type one is turned with the reverse side up. The holes cored through the center in the rough casting are first bored out to the required size. They are of two diameters, the top 1⅛ in. and the bottom 11/16 in. After the holes are bored out the facing tool is inserted and the top portion is finished. The cutting bit is then removed by loosening the knurled collar and the shank is lowered so as to project through the top surface. The tool is then inserted inside the casting and the underside of the top boss, together with the top side of the lower boss, is finished. The final operation consists of finishing off the face at the bottom. For this the handle is reversed.

In the accompanying illustration the cutting bit is shown at the extreme left, the sleeve which fits over the shank in the center and the shank itself with the knurled clamping collar to the right. The jig, with



Fixture for finishing brake handles and plug gages for testing

$200

for 100 Words

First	$200
Second	$100
Third	$ 50
Monthly Prize	$ 25

AWARD of the first monthly prize in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition, announced in last week's issue, has stimulated efforts to be the winner of one of the capital prizes as well as a monthly prize. Who will be the winner of the next monthly prize? One thing that has received comment is that but a very short description of an idea can win the prize. This is one time that the number of words does not count. It is the value of the idea that receives first consideration.

The real stimulus in all sports is that there is a chance to win. We play harder, work harder and think harder when there is sure to be some recognition that the best effort will be acknowledged. The prizes in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition are offered as a stimulus to maintenance men in any electric railway department to develop and adopt improved methods for performing a routine job. The prizes will be awarded primarily on the value of the idea presented and its adaptability to maintenance work. Still greater value than that afforded by the cash prizes may result from the recognition that the winners can be considered as leaders in improved maintenance.

GENERAL PROVISIONS

ANY employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 will be awarded each month. Groups of articles submitted were published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL for May 21 and June 18, 1927.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made. The manuscript should also be marked "Maintenance Competition."

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

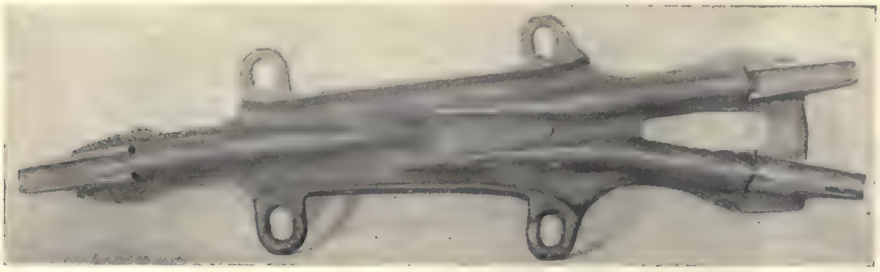
The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

two handles in position, is shown in the background. The two small parts in the foreground are plug gages for checking the size of holes bored in the handle.

New Equipment Available

Overlapping Runner Trolley Frog

CUTTING of the pan by the trolley wheel is said to be eliminated by the type CF overlapping runner trolley frog developed by the Westinghouse Electric & Manufacturing Company. The open space in the pan has been removed by overlapping the runners so that at all times the wheel rides on the runners and the flanges do not touch the pan. This results in from three to four times the length of life of the open pan frog. This type of frog insures more positive tracking of the wheel. It is equipped with bayonet type approaches, which are easy to install and which give a smooth transition of the wheel from the wire to the runner of the frog. The frog is made in 15-deg. right-hand and left-hand V shape and 20-deg. right hand and left hand. It is made for all sizes and shapes of wire.


With this frog the trolley wheel flanges do not touch the pan

Cradle Assists in Framing Poles

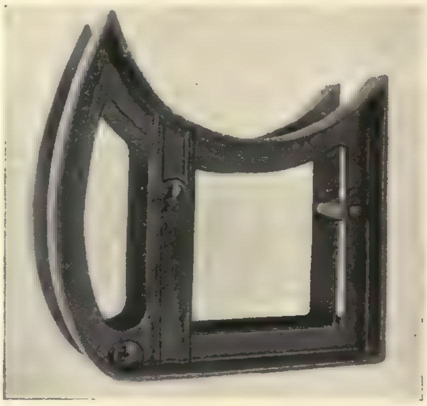
DURING the past years of pole line construction crews have followed the practice of lifting the pole up bodily while a support was placed under it. To reduce the number of accidents which occur from this method and also to provide an easier means of framing poles the E-Z-Up pole cradle has been developed and is now being marketed by Farnham & Cunningham, Los Angeles, Cal.

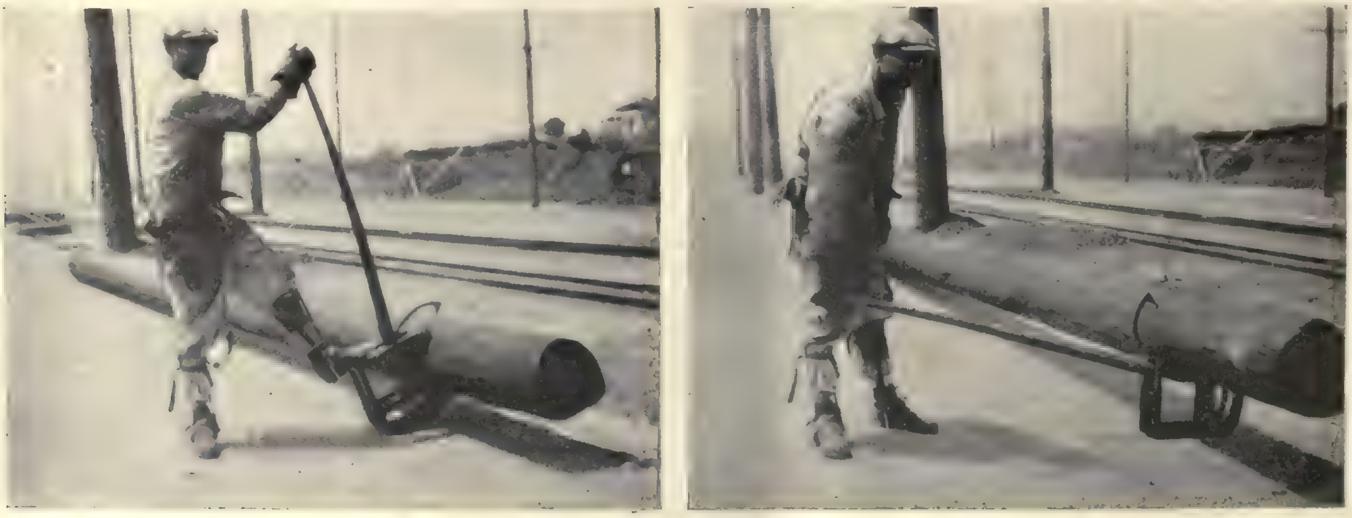
This new pole cradle uses the cam principle to lift a pole into position for framing. It is made of malleable steel and a cant hook or peavey is the only additional tool equipment necessary besides the cradle. In using, the E-Z-Up pole cradle is placed against the pole and the point of the cant hook or peavey is dropped between the two rockers so that the end presses against the cross bar nearest the nose of the cradle. The hook then catches in the opposite side of the pole and by pulling the handle and pressing with the foot against the heel of the cradle the pole is rocked into position. In case the pole does not lie with the proper face up it can be rotated easily in the saddle of the cradle by the use of the cant hook.

If it is desired to raise the end of the pole to a higher position, the cradle should be placed further down on the pole. It can be placed at the approximate center of gravity of the pole and one man can turn the pole easily end for end by adding his weight to the high end of the pole. Where work is to be done on soft or sandy soil a board or thin steel plate should be placed under the cradle to keep it from sinking into the ground.

A lineman of average weight has no difficulty in lifting a 65-ft. cedar pole with this device.

Cradle and cant hook in position to lift pole


The E-Z-Up pole cradle


At left, with the workman's foot pressed against the cradle, the handle of the cant hook is drawn toward him. At right, final position of the pole as it rests on the cradle

Association News & Discussions

Field of the Motor Bus*

BY A. J. BROSSEAU
President Mack Trucks, Inc.

IF WE glance at the statistics of bus use we will find that of the 80,000 vehicles now in service, 32,778 are employed in transporting children back and forth from school. This business is nearly all in the hands of the so-called independent operators. For future bus use here is one of the largest fields.

As to the rail carriers, there are indications on every side that they should extend the use of the bus in urban operations. Two of the most promising fields are:

The marginal area in every city, in which rail car services are performed at a loss.

The de luxe express service from these districts to downtown areas, or both of these services.

In these fields the wideawake and forward-looking rail carrier can employ the bus to his advantage and render his customers better service, at lower cost, than he can by using the trolley.

The place of rail lines in handling mass transportation in congested centers appears, at the moment, to be secure from an economic point of view.

At what point of thinning density, however, the bus begins to give a superior all-round service upon an economical and profitable basis is a question upon which there is not yet conclusive evidence. We know that the vehicle has been substituted for entire trolley systems in 65 towns and cities, all of them under 100,000 population. Whether the bus, in its present state of development, can replace the trolley in cities of larger size must be decided by the experience of the rail operators with buses.

This experience, to be worth while, must be based on facts—all the facts. "Experience" to prove that buses are not as efficient or desirable as the trolleys can easily be upheld by any one who is determined to prove the superiority of the trolley by overlooking some of the facts. On the other hand, the case of the bus must be proved by facts—all the facts. The time has come when both trolley and bus must stand or fall on their respective merits.

Eventually, all street railway companies come to the point where new equipment has to be purchased, new rails or pavement or both installed, and power houses renovated. When this happens they must decide whether it is advisable to substitute buses for rail operations.

When the bus first made its appearance in the rural field there was a common impression among rail operators that it was destined to make serious inroads upon their passenger business. Events of the past year and particularly the investigation of the Interstate Commerce Commission have done much to clarify this situation and bring out the facts. We have only to read the testimony of such high railroad officials as P. S. Eustice of the Burlington, F. A. Wadleigh of the Denver & Rio Grande, F. A. Coley of the New York, New Haven & Hartford, and Lewis Saunders of the Gainesville & Northwestern, to appreciate that it was the private automobile—not the bus—which was responsible for nearly all railroad passenger business losses.

The experience of the 61 railroads now operating motor buses would tell a story of savings effected by the substitution of the bus for the unprofitable branch-line rail operation, and that the rail lines are beginning to realize the benefits of improved public relations, growing out of a more frequent and more comfortable service to the public.

I believe that as railroad men give more and more time to the study of savings in costs to be effected by motor transportation, they will turn increasingly to the use of the bus for local operations. In many instances this would mean competition with, or acquisition of, or contract relations with existing independent bus lines. But whatever the method, there will be an expansion of bus services by rail operators, who will then, without extra cost to them, be enabled to give the public more frequent and satisfactory service.

Regardless of the extent to which steam or trolley rail lines go into the bus business, there will remain for the independent bus operator a large field in which he can develop a much needed service to the public. It must be remembered that the greater percentage of the bus movement is not competitive. Assistant Secretary of Commerce J. Walter Drake has pointed out that the bus has placed in touch with the railroads some 45,000 communities not located on rail lines. I believe these independent bus operations will be in the hands of responsible owners operating large or small fleets as local conditions justify.

LIBERAL REGULATION NEEDED

The troublesome question of regulation is as yet unsolved. I am not an authority on the subject, but permit me to point out some elements which I consider fundamental.

One of the chief virtues of the bus is its mobility. It does not run on rails, but it can go wherever there is an improved road.

It is not costly to stop, hence it can pick up passengers at any point.

Rates per mile should not be uniform unless road and other conditions are comparable.

Regulation should not be based on rail or bus practice of today.

Elaborate systems, such as apply to rail lines, are not needed.

Disregard all or part of these factors and you will retard bus development and so hamper it as to deny the public the benefit of its use.

I emphasize these points because in the initial stages of bus regulation precisely these things were attempted. Legislators, in many cases, did not take into consideration that the bus performs an entirely different service from that of the rail line and that it should be regulated as a bus—not as a rail vehicle.

Bus regulation, of the railroad type, is not only restricted, but it is contrary to the public interest. There are those who believe this sort of punitive regulation was, in the past, prompted by hostile rail interests. Regardless of where the responsibility lies, I am sure rail lines, now operating buses, will not approve of it.

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 27, 28—**Public Utilities Advertising Association, Hotel Albany, Denver, Col.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 11-14—**American Society Civil Engineers, convention, Denver, Col.**

July 22, 23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Sept. 13-15—**International City Managers Association, Dubuque, Ia.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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*Abstract of address delivered before Bus Division, American Automobile Association, Philadelphia, June 15, 1927.

Bus development can only come as we have regulation based upon the following principles:

Varying standards of rates.

Liberal policies with respect to development of new lines.

Sympathetic co-operation on the part of regulating bodies with respect to flexible schedules, so adjusted as to give necessary service with a minimum of waste.

Protection of existing lines of one type against interlopers of the same type, so long as public service requirements are met.

In short, regulation which considers first the needs and desires of the public, and second, the interests of the carriers.

I do not say there should be no regulation. But I do believe that such regulation as may be adopted should be based upon the differences, as well as the similarities, which exist between rail and highway operation.

The bus industry is young. It is virile and growing. It will grow faster and on a more substantial basis if those interested in its development keep constantly in mind that the public interest should have first consideration. And in this connection one should not overlook the interests of the public in existing rail carriers.

I am not one of those who believe that if a rail carrier has adequate physical facilities to carry passengers over a given route the public should be denied the use of the bus if it wants and is willing to pay for that form of transportation. In such instances regulating bodies should determine to what extent the rail carriers may add or substitute bus for rail service, or grant franchises to an independent operator. The carrier—whether rail or highway—should be protected against destructive and uneconomic competition so long as it properly serves the public.

With respect to taxation—the bus, like any other highway unit, should pay a fair charge for its use of the public highway. It is doing so today, as government figures prove.

Unfair and punitive taxation levied against the bus will be reflected in increased cost to the consumer of highway transportation.

Remember that the bus is in its infancy; it has been in existence only a few years; it has a field all its own; it renders a character of service different from, and not furnished by, rail carriers.

If these principles are kept constantly in mind, the independent operator and the rail carriers will find a broad basis of co-operation to the mutual advantage of both.

International Association Holds Convention This Week

THE fourth annual convention of the Internationaler Strassenbahn und Kleinbahnverein was held this week in Copenhagen, Denmark. The members of this association are electric railway and bus lines in Central Europe, and its headquarters are in Vienna. Sessions were held each morning this week from Monday to Wednesday inclusive, and Thursday was devoted to a trip to neighboring points of interest. A list of the technical papers presented follows:

"The Effect of the Sorbitic Treatment on Rail Life."

"Problems of City Operation in Sweden."

"Disturbances to Radio Broadcasting."

"Bases for Operating Statistics."

"Car Cards and Other Advertising on Street and Interurban Railways."

"Economies in Local Railway Operation."

"Methods of Trans-shipment of Freight Between Main Line Railroads and Motor Trucks."

"Co-ordination Between Main Line Railroads and Motor Trucks from the Standpoint of the Public."

"Co-ordination Between the Motor Bus and Street Railways in Large Communities."

"Co-ordination Between Bus and Truck Operation and Interurban Railways."

"Recent Improvements in Carhouse and Repair Shop Practice of the Copenhagen Street Railway, with Special Reference to Brake Inspection and Painting."

"Improvements in Car Speeds in City and Interurban Service."

It is understood that at the Copenhagen meeting consideration was to be given to the question of the consolidation of the association with the street and interurban railway and bus association of western Europe.

American Association News

Power Transmission and Distribution

FINAL reports of sub-committees and decisions to clean up this year's work formed a busy two-day session of the power transmission and distribution committee which was held at association headquarters, New York City, on June 16 and 17. Those present were F. McVittie, chairman; J. Walter Allen, W. H. Bassett, M. W. Cooke, J. H. Drew, J. C. Damon, C. L. Hancock, S. S. Hertz, K. J. Keith, A. J. Klatte, J. Leisenring, H. S. Murphy, J. F. Neild, W. J. Quinn, M. B. Rosevear, W. Schaake, A. Schlesinger, R. D. Wade, C. H. Jones, sponsor, and H. C. Casey representing G. F. Wennagel.

A number of new subjects of interest to power transmission and distribution engineers were suggested for consideration by ensuing committees. Sub-committee No. 1 on review of existing standards reported some desirable changes and recommended that the specifications of electric conduit construction be referred to next year's committee, also that lightning protection on car and line equipment be studied by a special committee.

Sub-committee No. 2 on specifications for catenary material presented a progress report that was adopted and will be reprinted in this year's proceedings. Changes were suggested as a basis for revising these specifications.

Sub-committee No. 3 on trolley wire wear reported that the work of the last two years will be brought up to date and that tabulations and graphs will be prepared for comparative purposes. Mr. Murphy, chairman of the committee, presented a design for a measuring device for trolley wire.

Sub-committee No. 4 on specifications for high strength trolley wire reported that a compromise with the A.S.T.M. committee on specifications for high strength trolley wire has been reached. If this recommendation passes both the A.E.R.A. and the A.S.T.M., a final specification will be in effect.

A report was presented by sub-committee No. 5 on radio interference to the effect that this sub-committee be combined with the inductive co-ordination sub-committee in order to furnish information that may be desired regarding reports of interference. Sub-committee No. 6 on inductive co-ordination reported that no definite developments have taken place during the year and so a progress report only can be made.

A recommendation from sub-committee No. 7 on feeder ties between automatic substations was presented to the effect that the subject should be discontinued.

Sub-committee No. 8 on comparison of operating methods and sub-committee No. 9 on trolley wire reels presented progress reports.

A.E.R.A. Reports in Preparation

SPECIAL reports are being prepared by the Bureau of Information and Service of the American Electric Railway Association, and will be available upon request by member companies, as follows:

Bulletin No. 144.—*Operating Costs of Electric Railway Motor Bus Lines*, 1926.—A summary of the operating costs of 140 electric railway bus undertakings in 1926 and a comparative study of the operating costs of 102 bus operations in 1926 and 1925. The operations have been classified as city, interurban, or combination city and interurban service. Details of average operating expenses are given for each group and the depreciation methods adopted are analyzed and presented in tabular form.

Bulletin No. 145.—*Comparison of Electric Railway Operating Conditions, Operating Expenses and Results of Operation on Various Unit Bases.*—This is a tabulation of comparative unit figures and ratios derived from the operating reports of electric railways in 1926. The cities are grouped according to their population and there is shown for each city the riding habit, average speed, number of revenue passengers, car-miles per mile of track and per car operated, revenue per mile of track, operating ratio, number of passengers per car-mile, proportion of passengers using transfers, cost of maintenance of plant and equipment per car-mile, per unit of property maintained and in per cent of total operating expenses. The operating expenses as distinct from maintenance expenses are also given on comparative unit bases and in per cent of total expenses.

Bulletin No. 146.—*Accident Prevention and Safety Work of Electric Railways.*—Gives a list of companies carrying on accident prevention or safety work and shows the type of accident prevention work done and what these companies think of its effectiveness. The types of safety work covered are bonus awards to trainmen, competing contests, safety campaigns, organization of safety committees, employment of safety engineers, etc.

The News of the Industry

Fare Increase Accepted in Buffalo

International Railway Makes Statement in Which It Enters Plea for Public Support

Formal acceptance has been noted by the International Railway of the order of the Public Service Commission increasing the rate of fare in the city of Buffalo from 8 cents, with two tokens for 15 cents, to 10 cents with three tickets for 25 cents. The company has assured the commission that it welcomes the opportunity to proceed with track and paving reconstruction. As the opinion of the commission points out, the extensive program set up by the city cannot be completed in one season, nor can the company undertake it without revenues. In the memorandum of acceptance to the commission President Yungbluth said:

> While at this time the International Railway has no desire to make any further statements in regard to its expectations from the new fare, it feels that it can do no less than again call attention to its letter of June 8 to the commission. In view of the facts therein set forth, it is obvious that the International Railway can make no further promise than that which it now gladly makes, that although it believes the additional revenue in 1927 will be only $150,000, during this period it will spend $250,000 for track and paving reconstruction. Materials will be ordered at once. The earliest delivery procurable is about Aug. 15, at which time this work will commence. Track and paving reconstruction this year will be done on streets approved by the public authorities.
>
> The opinion of the commission further points out that prolonged and bitter controversy and litigation between city and company advantage neither. In the hope of ushering in the dawn of a new era the International Railway is willing to co-operate with the city, by settling at once all litigation, so that this new fare may have a fair trial under the most auspicious circumstances. Furthermore, the company will gladly enter into conference with the city, as suggested by the commission. The railway also again restates its readiness to serve the public convenience by starting bus lines in accordance with the plan agreed upon by the city, the business organizations and the company, and repeatedly demanded by citizens in the districts to be served.
>
> Since the International Railway will devote this year more money to the reconstruction of track and paving than it believes will be produced by the new fare, it is hoped that the public will support this program by increased riding.

The letter of June 8, to which reference was made, follows:

> Newspapers have recently indicated that the Public Service Commission may authorize an increased fare of 10 cents cash, three tickets for 25 cents, coupled with the requirement that the company this year undertake a track reconstruction and paving program of more than $900,000.
>
> Upon the granting of any additional fare, the people of Buffalo, assuming the proceeds to be sufficient to meet the necessities, would expect the company to commence a substantial reconstruction program. That is the outstanding thing in the public mind.
>
> The following facts are again brought to the attention of the commission lest by any utterance or order it should create in the public mind hopes and expectations which are beyond the power of the company to fulfill.
>
> The additional revenue from such a rate of fare is by International Railway traffic engineers optimistically estimated at $300,000 a year. This is based upon a loss in riding of 7½ per cent under 1926. As the company is already experiencing a loss of 6 per cent under last year, a fare of 10 cents cash, three tickets for 25 cents, will produce revenue equal only to that of 1926.
>
> Nearly nine months ago the railway petitioned the Public Service Commission to grant in the city of Buffalo increased car rates—a straight 10-cent fare. The outstanding circumstances demonstrating the necessity were stated. Briefly they are:
>
> The International Railway has shown a loss each year from 1918 to 1925.
>
> The International Railway stockholders have received no dividend since 1918, but have contributed $4,140,445 to the company.
>
> There is an increasingly insistent demand for street repaving and track reconstruction. The cost to the company in Buffalo alone for such work, now pressing, exceeds $2,000,000. Additional reconstruction will be required from year to year, in the future.
>
> The company desires to do this work, but can do it only as fast as the commission makes available the additional revenue necessarily required.

Master Celebration Staged by New C., H. & D. Railway

Old Equipment Burned Before Public Assemblage as Final Act in Program of Complete Rehabilitation of Ohio Interurban—Celebration Preceded by Dinner in Company's Shops

From 10,000 to 20,000 people gathered on the evening of June 22 in a natural amphitheater just north of the new Moraine shops of the Cincinnati, Hamilton & Dayton Railway and cheered as the flames fed by the 30-year-old electric railway cars lighted up the countryside.

The event was staged by the railway in celebration of the completion of a rehabilitation program costing nearly $2,000,000. This included the acquisition of a new steel and concrete shop building at Moraine, extensive additions to freight terminal facilities, purchase of an entirely new complement of 40 C.E.R.A. standard box cars with necessary locomotives, overhauling of the power transmission and distribution system, including the construction of eight full automatic substations, and practically complete substitution of new de luxe cars for all of the company's former interurban and city equipment.

New de luxe city cars built for the road by the Cincinnati Car Company for service at the Dayton end of the line have been in operation for six weeks and have already shown an increase in passenger revenue of 13 per cent over the six weeks prior to their installation, or 20 per cent increase in comparison with the corresponding period of last year. Delivery of ten new interurban cars by the G. C. Kuhlman Car Company marked the arrival of the last of the new equipment for the property and was the occasion for the community celebration to mark the beginning of a new era on this road through the Miami Valley, which has had a career of financial difficulties, lapsed leases, foreclosures, receiverships and legal battles.

One Car for Each Community

An old, decrepit car for each important town along the line was drawn up in the center of the field where the celebration was staged. The mayors of each of these cities touched in rapid succession the seven buttons which set the spark to the fire that spelled the end of run-down equipment and old-fashioned methods. Through an elaborate outdoor amplifier system Dr. Thomas Conway, Jr., president of the railway, whose imagination, faith and courage were responsible for the rebirth of the interurban railway, explained to the thousands within hearing of his electrically magnified voice the significance of each step in the program and the plans and hopes of the railway for the future.

Great Public Interest

Under cover of protecting darkness, all of the company's new interurban equipment had been lined up on the railway embankment above the heads of the gathering. As the flames from the rapidly consumed cars in the fire began to subside floodlights properly located in the field and suddenly switched on threw their rays full on the new cars, which shone in the darkness before the eyes of the large crowd.

Sirens and bells on the cars were sounded as a fireworks display burst in brilliant rockets and bombs far up over the heads of the crowd and a set piece announced in glaring letters the birth of "A New C., H. & D. Railway."

For nearly half an hour the display continued while the old cars burned themselves, until only the frames stood revealed like a skeleton. Train crews on the new cars above, in carefully groomed and pressed uniforms, clanged their gongs and yanked at the control cords of the sirens.

So great was the throng thus attracted to celebrate the rebirth of an interurban railway that every approach to the site of the spectacle was jammed with automobiles for hours preceding and following the event. The elaborate parking facilities provided were taxed to capacity. In addition, roadsides and vacant bits of property in every direction were jammed with cars while their owners sought a view of the strange spectacle presented by the burning of cars which they had seen daily since childhood and had come to look upon as inseparably associated with the idea of an electric railway ride.

PRECEDED BY DINNER

The public celebration was preceded by a dinner in the company's new shop and office building to more than 400 guests, comprising the prominent public officials and leading business men of the Miami Valley, security holders and officials of the railway and visiting executives from many other railway properties. These men came from various cities along the line in special cars and were permitted to inspect the property before attending the celebration. During the dinner President Conway reviewed the history of the property and described the extent of the rehabilitation program. He summarized the aims of the new management and made a strong plea for the active public co-operation and support so necessary to the success of the ambitious project which had been undertaken.

As the various special trains decorated with banners announcing the celebration proceeded through the communities along the line the population turned out in force.

Chicago Enabling Legislation Encounters Opposition

Chicago's five traction bills, after passing the state Senate with votes to spare, have encountered some little opposition in the committee of the House of Representatives, to which they passed from the Senate. Politics, both state and municipal, and newspaper criticism have been unusually heated in the controversy which has developed.

A number of amendments have been submitted to the committee which is considering the bills and a special meeting of the Chicago City Council resulted in an almost unanimous approval of these proposed changes. The representatives of the companies have not signified their approval of the amendments, at the present time, and it is considered doubtful that they will accept them. Among the changes proposed are:

> Change in the indeterminate franchise bill to limit a franchise to a 40-year period and only in excess of twenty years upon a referendum vote.
>
> Changing the bill giving the elevated lines power to merge the various transportation companies in Chicago so that any of the companies might carry out the consolidation.
>
> Amendment of the bill creating a commission with authority over the transportation companies composed of state, county and city appointees so that a majority of the members of the commission will be city appointees.
>
> Explicit definition of the terms "non-user" and "mis-user" used in one of the bills.

The Chicago Aldermen were loud in their demands at the meeting for home rule to its fullest extent. One of the City Council declarations on the amendments, showing clearly their stand on the bills, read as follows:

> We declare that if the bills are not amended, or if they are left in the unfair condition in which they passed the Senate, then the resulting legislation will not be enabling, but will be so obstructive that this body will be unable to make use of the legislation in attempting to solve the railway problem.

A committee of Aldermen was dispatched to the state capital to present these demands before the transportation committee of the House.

A statement setting forth the concise stand of Samuel Insull, head of the elevated lines, in the question was issued by him to the newspapers.

New York City Would Recapture Rapid Transit Lines

Columns of space have been devoted by the New York newspapers to the discussion of the tentative unification plan for New York City rapid transit lines proposed by the Transit Commission and the Board of Transportation. Reduced to their simplest terms the plan contemplates the purchase by the city of the Interborough Rapid Transit and Manhattan Elevated and recapture of the Brooklyn-Manhattan Transit Corporation's subway line. The city would buy Interborough stock at 30, guarantee 2½ per cent on Manhattan modified guaranteed stock, or as alternative pay 50 a share, exchange the city's 3 per cent bonds for $154,000,000 of I.R.T.'s first and refunding 5s, $34,000,000 of city 4 per cent bonds for $34,000,000 of Interborough's ten-year 7 per cent gold notes, and city 3 per cent bonds for I.R.T.'s $10,500,000 ten-year 6 per cent notes. The reduction in fixed charges on I.R.T. and Manhattan under this plan would be $7,500,000. The cost to recapture the B.-M.T.'s subway lines would be $52,728,000. Samuel Untermyer, special counsel for the commission, is said to have held conferences with members of J. P. Morgan & Company representing Interborough bondholders. The plan would merge the I.R.T. and B.-M.T.'s recapturable subway lines with the new city system now being constructed. A corporation would probably be formed to operate the new system, with the city having a substantial representation on the directorate.

Twenty-five Year Men Gather

The fifth annual reunion of the 25-Year Club of the East St. Louis & Suburban Railway was held recently in East St. Louis, Ill. The business meeting was in the office of President W. H. Sawyer, an honorary member of the club, and at this gathering fifteen new members were admitted and resolutions of respect to the memory of John Burke were adopted. Following this gathering the club members traveled in company buses to Loew's State Theater in St. Louis, Mo. After the show dinner was served at the Missouri Athletic Association. The place cards were checks for $25 each. Two of the charter members of the club are dead, but eight others were present. One of the honorary members of the club is dead, but the others present were W. H. Sawyer and F. E. Allen. Nine of the men admitted to membership May 18 are motormen, one a division superintendent, one an assistant superintendent of transportation, one a bus operator, and two are conductors and motormen.

Municipal Railway Proposed to Be Resubmitted in San Francisco

City officials of San Francisco, Cal., are shaping plans for another bond election in November linked with the regular municipal election, at which the Municipal Railway extensions and the Spring Valley purchase, defeated at the recent election, will be submitted again. As things stand now the city is faced with the problem of a municipal railway tunnel and no money to run the railway through it, the same situation with respect to the Bernal cut and no place to put Hetch Hetchy water when it arrives.

City Engineer M. M. O'Shaughnessy is reported to have said:

> The results on the Spring Valley and railway issues showed clearly that the people of San Francisco are in favor of these projects. Both received a substantial majority, but by reason of the light vote failed to receive the two-thirds majority required for bond projects. They should be resubmitted at the earliest opportunity.
>
> We now have a tunnel with no funds to finish the railway. A portion of the line can be laid, but it cannot be completed. There is no money to purchase the rolling stock, and no place to put it if we buy it. We cannot borrow equipment from other municipal lines as all are used to capacity.
>
> As to the Bernal cut, for which the people voted $1,400,000 bonds, we will proceed at once with the construction of both the vehicular roadway and roadbed for the railway tracks. But by failure to pass the railway bonds the voters leave us without funds to lay the tracks.
>
> Our plans are drawn for the cut, we have purchased $250,000 in rights-of-way, and will begin actual excavation in 90 days.

Unusual Turn Taken by Seattle Suit

Litigation over the question of the priority of the Seattle Municipal Railway purchase bonds came to a sudden but temporary halt in the federal court recently when the clerk of the court signed a *pro confesso* order on motion of the Puget Sound Power & Light Company in the suit of John G. Von Herberg against the city of Seattle, Wash., and its financial officers, in which suit the newer company had appeared as a cross-defendant. The order, however, is subject to suspension, alteration or rescinding by the trial court, on a proper showing. In a cross-complaint the power company had contended that before the transfer of the railway to the city the Twichell case was carried to the State Supreme Court and the contract held valid, giving the bondholders a first lien on gross revenues of the system. Mr. Von Herberg had attempted to have labor costs adjudged the first lien.

In the motion of the *pro confesso* order the power company recited that Mr. Von Herberg had failed to answer, plead or demur to the cross-complaint within 30 days, as required under the court rules. The order simply means that by his failure to make an answer Mr. Von Herberg is held to acknowledge that the allegations of the cross-complaint are true and that the bondholders have first lien against revenues.

The fact that the court can set aside the order or alter it leaves the way open for further proceedings, but the present status of the litigation in the federal court is that the power company has won its contentions and Mr. Von Herberg is eliminated.

Wage Negotiations in Chicago in Final Stage

Negotiations on the wage question between representatives of the union of surface lines and elevated trainmen and company officials in Chicago entered their final stage during the week ended June 18, when meetings to talk over the demands of the men were held by officials of both transit organizations.

At a referendum of the surface lines men the union officials were clothed with authority to declare a strike unless the demands of the men were met by the company. The poll resulted in 162 voting against the matter of clothing the union officials with authority to act for them, out of a total of 11,961 votes cast. The elevated employees vote resulted in nearly as overwhelming a majority in favor of the same proposal.

Both unions are asking a wage increase of 15 cents an hour, the present scale on the surface lines being 75 cents and on the elevated 77 cents. In addition the surface lines men ask a paid insurance policy of $1,000. Surface lines men, it is said, have agreed not to compromise on an increase of less than 5 cents an hour, bringing their scale to 80 cents and restoring a 10-cent cut made in 1922, when fares were reduced from 8 to 7 cents.

Changes in working condition are also asked by the two unions.

William D. Mahon, international president of the union, has been in Chicago for the past week, taking an active part in the negotiations.

Officials of the Surface Lines point to the federal receivership under which they are operating as militating against any wage increase. The company is also operating under temporary franchises.

Tacoma Marking Time on Fares and Transit Report

In order to hasten the time when the Tacoma Railway & Power Company, Tacoma, Wash., may submit a written answer to the report of Kenneth G. Harlan, city utilities engineer, upon the operations and finances of the company, submitted some six weeks ago, the City Council has authorized Mr. Harlan to confer with the company accountants about the figures from which he made certain deductions. Richard T. Sullivan, manager of the railway, told the Council the company can have a written answer ready within 60 days. Mr. Harlan recommended to the Council that no attempt be made to discuss his report with company officials until after an answer in writing had been made by the company and he had had time to reply to this. The discussions could then be directed better. Mayor M. G. Tennant indorsed this.

The question of the fare basis to be used in the 60-day period allowed for the company reply has been left open for a meeting to be held on June 28. Mr. Harlan reported that the average fare under the new fare basis, with the weekly ticket at 30 cents, allowing rides at 5 cents, tokens at three for 25 cents and 10-cent cash fares, was 7.4 cents for the weeks examined. He estimated the increased income for the company at 6 to 7 per cent. The possibility of reducing the ticket to 25 cents has been discussed, but it is felt that data are still too meager to permit a decision. The present schedule will expire on July 2.

Outfits of New Design for New Jersey Men

Railway and bus operators of the Public Service Railway and the Public Service Transportation Company, Newark, N. J., are soon to be attired in natty new uniforms of a design and color entirely different from those now worn. The change is to become effective at once for new men entering the service and will be adopted by present employees as their old uniforms wear out and they buy new ones.

The new and the old on the Public Service Railway

The familiar blue uniform will give way to a uniform of heavy whipcord, olive green in color. The official Public Service design will be embroidered on each side of the collar. Breeches and black puttees or long trousers will be worn.

An innovation is the adoption of an army officer's style of cap, of the same material as the coat and breeches, but with brown visor and strap. A nickeled silver badge of attractive design will replace the enameled badge now worn on the cap.

Temporary Fare Increase Denied in Los Angeles

The Los Angeles Railway, Los Angeles, Cal., was denied a temporary increase in fares to 6 cents by the state Railroad Commission on June 20. This request was made by the company pending a decision on its application for a permanent 7-cent fare to replace the present 5-cent fare. The application for the permanent 7-cent fare is scheduled to be heard by the commission on Aug. 9.

Rehearing Ordered on Albany Fares

The Public Service Commission of New York on June 23 ordered a hearing on the application for a rehearing filed by Albany, Troy and other municipalities on the order of the commission made on June 14 increasing fares on the lines of the United Traction Company. The hearing will be held at Albany on June 28. The new tariff goes into effect July 1.

Injunction Against Birmingham Rerouting

A temporary injunction has been granted restraining the Birmingham Electric Company, Birmingham, Ala., from abandoning its Avenue C line, in accordance with the provisions of the traffic survey of Ross Harris, traffic expert. The petition was filed by an attorney acting for property owners along the line. J. S. Pevear, vice-president of the company, says that the Birmingham Electric Company "is merely carrying out the traffic survey, and this injunction will have no effect on the remainder of the traffic survey, which will go into effect June 26." Under this traffic survey a number of railway lines are to be rerouted, especially in the downtown loop section. The city is not made a party to the suit.

Department Store Owners Warned of Parking Menace

Unless drastic steps are taken to improve traffic conditions in Chicago and other large cities, the time will soon come when the inconveniences to shoppers will be so great that they will be virtually prevented from entering downtown shopping and business districts.

That is the opinion of Miller McClintock, director of the Albert Russel Erskine Bureau of Street Traffic Research, as given to members of the National Retail Dry Goods Association at their convention in Chicago, recently.

Mr. Mitten Not to Participate in Brotherhood Banking

Dr. A. A. Mitten, vice-president of Mitten Management, Inc., sent the following telegram on June 24 to William B. Prenter, president of the Brotherhood of Locomotive Engineers, at Cleveland, Ohio:

> The apparent impossibility of there being a sufficiently unanimous accord of the convention in approval prompts us now to request that the proposition by which our organization agreed to assist in the development of your banks and at the request of your advisory board, Mr. Mitten personally act as trustee in the working out of the venture and your other slow assets over an extended period be now withdrawn from further consideration by your convention.

It had previously been reported in the daily press that negotiations were under way between the Thomas E. Mitten interests of Philadelphia and the Brotherhood of Locomotive Engineers, looking toward a consolidation of the banking and financial interests of the brotherhood with the Mitten "men and management" interests.

Franchise Agitation Renewed in Omaha

Agitation has been renewed for another election to determine the status of the Omaha & Council Bluffs Street Railway with respect to the future franchise in Omaha. Business men feel that the city's standing abroad would be helped by a new franchise with definite limitations rather than to allow the matter to hang on until the federal courts have passed on the application of the trustee for the bondholders to have the franchise declared perpetual. A counter proposal by a group headed by Former Mayor Ed P. Smith is that no franchise be granted until the company agrees to sell to the city the bridge over the Missouri River across which its cars operate between the two cities and on which a large and profitable vehicular traffic is handled on a toll basis.

The city wants a free bridge. Under a law shortly to become effective the city would have the right to buy or build one, if the voters so authorize. Mr. Smith urges that the city buy the company bridge instead of building a competitive structure. The railway is understood to be reluctant to divest it of ownership of the structure, particularly in view of the present unsatisfactory earning status of its railway lines.

Valuation Figures for Louisville Expected Soon

The valuation of the property of the Louisville Railway, Louisville, Ky., now being completed by John A. Beeler, New York, is expected to be ready on July 15. This valuation will become the basis on which the Board of Works will regulate fares, under the franchise granted on Sept. 21, 1926, in which it was agreed that the city, through the Board of Works, would arrange for the appraisal of the properties.

Broadcasts Safety and Courtesy

The Nashville Railway & Light Company, Nashville, Tenn., has started a summer series of broadcasting hours through its school for safety and courtesy. Brief outlines of work being done by the railway and light department in furthering these desiderata among its employees were given by J. P. W. Brown, vice-president and general manager; Superintendent Davis of the railway, and W. A. Brown, safety director of the company. The programs, including musical numbers, will be broadcast every two weeks.

$143,175 Verdict Awarded in Washington Case

The Washington Railway & Electric Company, Washington, D. C., has been awarded judgment by Chief Justice Walter I. McCoy in the Circuit Court against the Washington, Baltimore & Annapolis Electric Railway for $143,175 and interest as the amount due under an operating agreement between the two roads by which the Annapolis company uses the tracks of the Washington company. Neither road is satisfied with the verdict, as both noted appeals to the Court of Appeals. The Washington company sued for $275,000. The Annapolis company admitted owing only $15,440. The case was tried twice without a jury. Justice Hoehling heard the case the first time and ordered a retrial without deciding any of the issues.

Boston Looks Ahead to Fall Courses

Opinions are many and honest in *Co-operation* on how the educational courses conducted by the Boston Elevated Railway, Boston, Mass., are regarded. In the May issue of this paper many comments are printed which speak for themselves. This forum is considered of value not only in regard to the action of the committee on education for next fall's program but also in assisting employees to choose courses best suited to their needs. In the discussion the chief electrician, maintenance department, has something to say about "Investing Savings"; the foreman, armature shop, expresses his views on "Foreman Conferences," and the general storekeeper passes judgment on the course in "Public Speaking."

Wage Negotiations in Connecticut

Proposals made by employees of the Connecticut Company, New Haven, Conn., for a wage of 75 cents an hour for operators of two-man cars and 15 cents additional for operators of one-man cars have been rejected by the Connecticut Company. The company has likewise rejected the proposition that the working schedule be fixed at eight hours a day instead of nine. It is considered likely that the men will continue their conferences and submit a compromise proposition.

President Punderford told the committee that the company could not afford to grant the raise in wages. It has paid no dividend since 1916 and is reluctant to increase fares, a contingency that could hardly be escaped under any upward revision of the wage scale.

"Low-Cost Riding"

In an eight-page pamphlet which it has issued the Beaver Valley Traction Company, New Brighton, Pa., sends a message to its patrons on the elements of low-cost riding yesterday and today. According to this company, Dad will tell you how the coming rails made low-cost riding possible. Now, according to this booklet, the question is being asked, will the street cars be replaced by the bus? The Beaver Valley Traction Company management states that as an auxiliary to the street car the bus is proving its value, but for carrying large crowds quickly and economically the street car is indispensable. The bus and railway management in the Beaver Valley territory is bound by the closest co-operation and its common end is to give the people of the Beaver Valley district a transportation service which is as near perfect as anything can be which is humanly operated.

Foreign News

Faster Cars in London

The Metropolitan Electric Tramways, which operates an extensive system in Middlesex and has a through running arrangement over the northern lines of the London County Council Tramways, London, England, has begun to equip its cars with new motors capable of giving a maximum car speed of 30 m.p.h., but the highest speed allowed by the Ministry of Transport is 20 m.p.h. This is an increase of 4 m.p.h. on the formerly permitted maximum. Increase in average speed will be aided by more rapid acceleration and by the abolition of a number of stopping places.

Rail and Road Competition in Britain

Transportation on the highways in Great Britain of motor vehicles carrying both passengers and freight has become so enormous as to be severely competitive with the railways according to a recent appeal of railway representatives. As a result of this increased traffic, a committee representing the main railways of Great Britain and three trade unions of railway employees, laid before Winston Churchill, Chancellor of the Exchequer, a weighty memorandum appealing for more parliamentary control over the highways. The government, Mr. Churchill said, is considering the question of block grants instead of percentage grants for road maintenance. And he pointed out that last year's budget showed by increased taxation on road motor vehicles that measures had been taken to meet the request of railway representatives.

Tramways' Overhead in England Goes to Relief of Taxpayers

Tramway revenue of £207,000 for the last 25 years has been contributed by Newcastle-on-Tyne toward tax relief of the community. The amount received for the last several years has been £14,000, meaning a reduction of 1½d. per £1 on the taxes. It has been the ambition of municipal tramway authorities in all England to make profits substantial enough to reduce the local taxes levied on the various communities. Most of the tramways, however, instead of showing a profit are working at a loss, and it is believed that this year's showing, especially, is dubious because of the general effect of the coal strikes during 1926.

Net Income Lower.—For the year ended Dec. 31, 1926, the gross revenue of the Berlin Electric Elevated & Underground Railways, Berlin, Germany, was $7,171,973, against $5,730,242 in 1925. Expenses and taxes increased from $3,024,430 to $4,031,296 in 1926. After the consideration of depreciation and amortization, the net income for 1926 was $1,743,599, against a net in 1925 of $2,021,785.

Recent Bus Developments

Railway and Coach Terminal Opened at Michigan City

A new $200,000 union station for the joint use of motor coach and electric railway passengers was formally opened at Michigan City, Ind., on May 21 by the Chicago, South Shore & South Bend Railroad and Shore Line Motor Coach Company. The dedication of the big structure attracted a throng of more than 12,000 persons from all parts of northwestern Indiana and southwestern Michigan. The station project, including an inclosed motor coach loading shed and a large modern brick and steel garage adjoining, represents an investment of more than $200,000.

The station proper has a handsome façade of buff-colored terra cotta, with side walls of brick and large plate glass windows and revolving doors. It is a two-story structure, the floor above the main waiting room providing office space for officials of the motor coach company. The interior of the station is finished in light colors, with marble columns and attractive trimming. A luxuriously furnished ladies' lounge and large smoking rooms for men are located adjacent to the waiting room.

A steel-canopied loading shed, accommodating nine large motor coaches at one time and affording protection to passengers in inclement weather, is directly connected with the waiting room. The terminal is so arranged that motor coaches will always be kept off the public streets when receiving or discharging passengers.

The garage provides space for the servicing and storing of 30 large motor coaches, with three repair pits, a storeroom for tools and materials and other necessary facilities.

The station was rushed to completion in the record time of twelve weeks in order that it might care for the heavy increase in rail and motor coach traffic during the summer months. The new station will be used as a transfer point from train to bus by thousands of persons traveling between Chicago and the Michigan resort region.

Service Between Dallas and Fort Worth

Alfred F. Townsend, vice-president and general manager of the Northern Texas Traction Company, Fort Worth, Tex., announces that his company is to start bus service between Dallas and Fort Worth supplementing the regular interurban railway service. The new service is to be instituted as soon as a permit is granted by the Texas Railroad Commission, authorized to supervise and regulate bus service in Texas under the statute which went into effect on June 14. Mr. Townsend's company will purchase ten parlor buses, at a cost of about $10,000 each, and will operate these buses on a 30-minute schedule daily from 6:30 a.m. to 8:30 p.m. Bus terminals will be erected in both Dallas and Fort Worth, probably in connection with the interurban terminals. It is to meet growing bus competition between the cities that the new service is to be established.

Decision Expected in Louisville Case

A decision is expected shortly in the case of the Peoples Transit Company, a bus operating organization, against the Louisville Railway, carried by the former to the Court of Appeals, after the Jefferson County Court held that the railway had the passenger carrying franchise over streets on which it has railway lines in Louisville. It will be recalled that an injunction was secured against the Peoples company restraining it from operating bus lines in competition with the railway and stopping the buses after they had started. The case was carried to the upper court some months ago. In the meantime the Peoples company is at a standstill.

Buses Running Between Buffalo and Port Colborne

With the formal opening of the new $4,500,000 Peace Bridge across the Niagara River connecting Buffalo with Fort Erie, Ont., the International Bus Corporation, a subsidiary of the International Railway, Buffalo, started a new bus line between Shelton Square at Buffalo and Fort Erie Plaza at Fort Erie, Canada. Eventually, the International Bus Corporation will operate an interurban line between Buffalo and Port Colborne, Ont. Ten-minute service is being maintained on the new Peace Bridge bus route. Only through passengers can be carried on this line as the company has no franchise to operate the line in the city of Buffalo. By entering Canada, the new bus line does not come within the jurisdiction of the New York State Public Service Commission. De luxe gas-electric buses carrying 27 passengers are being operated on the new interurban division into Canada. The fare from Shelton Square to Fort Erie Plaza is 20 cents each way, of which 10 cents represents the bridge toll and goes to the Buffalo-Fort Erie Bridge Corporation. Ferry service formerly handled the traffic across the river at Buffalo.

New Peace Bridge over which International buses operate

De luxe bus at American approach to Niagara bridge

Financial and Corporate

Merger Plans Maturing in Indiana

The proposed consolidation of the Central Indiana Power Company and Terre Haute, Indianapolis & Eastern Traction Company and certain of their subsidiaries into the Indiana Electric Corporation involves the readjustment and exchange of five bond issues and six stock issues now outstanding in the hands of the public. The face value of the bonds to be readjusted is about $11,900,000 and par value of stocks $27,600,000, or a total of $39,500,000.

All these issues are represented by committees, which have designated depositaries and asked for deposits. The percentage of bond issues deposited at latest reports ranged approximately from 60 per cent to 90 per cent. Five stock issues deposited range from 63 per cent to 95 per cent. About 50 per cent was deposited of the sixth issue, one of the three smaller stock issues. The average percentage deposited by holders of all eleven stock and bond issues was 83 per cent.

A plan and agreement for the consolidation has been drawn up in complete form and has been submitted to the eleven committees, most of which have already taken favorable action. If all committees approve and their decision is accepted by sufficient depositors the agreement will go before the Public Service Commission of Indiana. If that body approves it and consolidation is effected, material benefits are expected therefrom, since one company has ample generating facilities and favorable power contracts, while the other has a load in excess of its efficient generating capacity.

The Indiana Electric Corporation when formed will be a subsidiary of the American Public Utilities Company, of which Samuel Insull is chairman and Martin J. Insull president.

Kansas City Securities Being Distributed

Notice has been given that the new securities are ready for distribution provided for in the plan and agreement dated June 1, 1925, for the reorganization of the Kansas City Railways, Kansas City, Mo. As provided in the plan, a new corporation, named the Kansas City Public Service Company, has been organized under the laws of Missouri and has acquired the properties and assets in the state of Missouri of the Kansas City Railways. The Missouri corporation also owns all bonds and stocks (except directors' qualifying shares) of the Wyandotte Railways, its Kansas subsidiary corporation, which owns the fixed physical property in Kansas. The railway property in Kansas is leased to the Missouri corporation, which conducts unified operations over all lines. A new railway franchise, extending to Jan. 1, 1957, has recently been granted to the Public Service Company by the city of Kansas City, Mo., upon terms believed to be fair and just to the company and the city.

The Kansas City Public Service Company has an authorized capitalization of 150,000 shares of non-par prior preferred stock, 250,000 shares of non-par preferred stock and 250,000 shares of non-par common stock. It has issued, as provided in the plan, 83,364 shares of preferred stock, series A, and 182,645.4 shares of common stock, plus an additional 1,000 shares of common stock issued at time of incorporation. The company has also executed a mortgage and deed of trust, dated July 1, 1926, upon its property and has issued thereunder, as provided in the plan, $12,465,200 principal amount of first mortgage 6 per cent gold bonds, series A. Issuance of these securities has been approved by the Public Service Commissions of Missouri and Kansas. The preferred and common stocks of the company (except directors' and inspectors' qualifying shares) have been deposited under a voting trust agreement extending for five years from July 1, 1926, the voting trustees being Melvin A. Traylor, J. K. Newman, William G. Woolfolk, George W. Davison and Powell C. Groner.

Volume of Business Grows

Six Per Cent More Passenger Traffic Carried on Chicago Rapid Transit Lines in 1926—Net Income Greater—Property Being Used More Intensively

THE business of the Chicago Rapid Transit Company, Chicago, Ill., in 1926 exceeded in volume that of any previous year in the history of the elevated system, according to the company's annual report.

A total of 228,812,766 passengers was carried, an increase of 12,767,191 over the previous year. In the month of December 20,980,331 riders were handled, the greatest number ever carried in a single month. Passenger revenues, because of the large increase in the number of customers transported, rose to $18,891,998, an increase of $1,105,523. The average rate of fare received was 8¼ cents. Gross revenues, inclusive of both the amount received from fares and from non-operating revenues, were $20,420,659, an increase of $1,138,771. Net income for the year was $1,117,632, an increase of $74,231. Dividends paid on the company's prior preferred stock totaled $375,740. Taxes were $1,663,456, or approximately 4½ times the amount paid to the company's stockholders.

INCOME STATEMENT OF THE CHICAGO RAPID TRANSIT COMPANY

For the year ended Dec. 31, 1926

Passenger revenue		$18,891,998
Other transportation revenue		1,259,156
Gross operating revenue		$20,151,154
Operating expenses:		
Maintenance of way and structure	$1,922,496	
Maintenance of car equipment	1,545,600	
Power	2,119,020	
Conducting transportation	7,228,708	
General and miscellaneous	1,318,373	
Total operating expenses (*a*)		$14,134,199
Net operating revenue		$6,016,955
Taxes, city compensation		1,663,456
Operating income		$4,353,499
Non-operating income		269,504
Gross income		$4,623,003
Deductions:		
Rentals	$1,039,525	
Interest on mortgage debt and equipment obligations	2,367,825	
Other interest (*b*)	32,260	
Amortization of discount	65,760	
Total		$3,505,371
Net income for year 1926		$1,117,632
SURPLUS ACCOUNT		
Balance, surplus Dec. 31, 1925		$1,731,713
Net income for the year ended Dec. 31, 1926 (as above)	$1,117,632	
Less dividends paid on prior preferred stock	375,740	
Surplus earnings for the year unappropriated		$741,891
		$2,473,604
Miscellaneous debits and credits (Net)		40,813
Surplus, Dec. 31, 1926		$2,514,418

(*a*) Total operating expenses include $316,086 credited to retirement reserve.

(*b*) No interest declared or paid on adjustment debenture bonds.

The company operated a total of 57,486,898 car-miles during the year, compared with 54,525,633 car-miles in 1925.

The report says the substantial increase in business was made possible through the intensive use of the company's property. Station platforms were increased in length and eight-car trains were placed in operation on most of the lines during the rush-hour periods.

The amount expended for extensions and improvements in 1926 was $1,574,979. In addition a large amount of maintenance and renewal of structures and equipment was done at an expense of $3,219,381. Important improvement work included extension of Rapid Transit Lines service to the western suburbs of Maywood, Bellwood and Westchester, this being accomplished through a trackage lease with the Chicago, Aurora & Elgin Railroad, whereby use is made of the latter's tracks; practical completion of extension of station platforms, so as to permit of eight-car train operation; the starting of construction work on the new $250,000 Wells Street Terminal Building, which will be of great convenience to west side residents, and the letting of a contract for the first unit of new shops to be located at Niles Center.

TRAFFIC AND REVENUE FROM FARES ON THE LINES OF THE CHICAGO RAPID TRANSIT COMPANY

	1924	1925	1926
Customers carried	212,901,024	216,045,575	228,812,766
Per cent increase		1.48	5.91
Revenue from fares	$17,656,082	$17,786,474	$18,891,998
Per cent increase		74	6.22

INCOME ACCOUNT COMPARED

	1924	1925	1926
Gross earnings*	$18,775,933	$19,281,888	$20,420,660
Maintenance, renewals	3,537,147	3,222,965	3,468,097
Conducting transportation, power, miscellaneous	10,222,503	10,122,229	10,666,102
Taxes	1,407,460	1,622,315	1,663,457
Total expenses	15,167,110	14,967,509	15,797,656
Net earnings	3,608,823	4,314,379	4,623,004
Fixed charges	2,807,448	3,270,978	3,505,372
Net income	$801,375	$1,043,401	$1,117,632

*Includes revenue from fares and rentals from company properties.

During the year the company was given the first award in a national public relations contest conducted under the sponsorship of the American Electric Railway Association for having done most during the year to win the good will of its customers.

There were 6,061 persons in the employ of the company at the end of the year. Continuing its policy of providing group insurance for its employees, the company extended the scope of this method of protection to provide sick benefits of $20 a week and also obligated itself to pay the full cost of the premiums for $1,000 death benefit for each employee, with double indemnity in case of accidental death.

Besides indicating the company's progress during 1926 in its educational activities and accident prevention work the report is a chronology of the rapid transit lines.

The financial reorganization of all the elevated railroads of Chicago was perfected in January, 1924. At that time they were combined in one company under the present name, the Chicago Rapid Transit Company. The progress made since then is illustrated by the accompanying comparison of figures for the three years.

Surplus for Washington-Baltimore Interurban

For the year ended Dec. 31, 1926, the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., realized a net income of $24,106, but on account of profit and loss net credits the company finished the year with a surplus of $32,071, against $245,242 in 1925. These facts were contained in the annual report to the stockholders. The decline in the number of revenue passengers carried is noted as follows:

1926	3,871,600
1925	4,021,766
1924	4,429,387
1923	4,644,472
1922	4,570,996
1921	4,692,860

One per cent of the gross operating revenue was credited to "Reserve for Injuries and Damages." The balance in reserve account on Dec. 31, 1926, was $115,333. The disbursements in payment of accident claims, suits, judgments and other expenses of the department amounted to 1.48 per cent of the gross operating revenues.

Car-miles operated totaled 4,479,856; of this total 4,209,483 were passenger-miles, 259,888 freight and 10,485 service-miles.

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY FOR THE YEAR ENDED DEC. 31

		1926		1925
Operating revenue		$2,564,047		$2,694,910
Operating expenses prior to provision for depreciation		1,826,038		1,994,723
Net operating revenue prior to provision for depreciation		$738,009		$700,187
Taxes assignable to railway and other operations		121,713		128,867
Operating income prior to provision for depreciation		$616,295		$571,319
Non-operating income (net)		29,853		27,516
Gross income for the year applicable to interest on funded debt		$646,149		$598,836
Deductions from gross income.				
Interest on funded debt	$522,513		$518,804	
Amortization of discount on funded debt	53,994		47,077	
Provision for depreciation	45,535		46,488	
		622,042		612,370
Net income for the year		$24,106		*$13,533
Profit and loss net credits during the year		7,964		258,776
Profit and loss gross surplus for the year		$32,071		$245,242
Dividends paid		None		None
Profit and loss surplus for the year		$32,071		$245,242
Profit and loss surplus at beginning of the year		773,080		527,837
Profit and loss surplus at close of the year		$805,151		$773,080

* Deficit.

EARNINGS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

	1926	1925	1924	1923	1922	1921
Per car-mile (cents)	49.65	53.00	52.00	54.30	56.13	53.60
Per miles of track operated	$15,237	$16,627	$17,763	$18,152	$18,248	$18,841
Per mile of road	$27,702	$30,185	$32,212	$32,916	$33,092	$34,173
Per passenger (cents)	45.00	47.71	46.76	45.58	46.98	45.97

$55,563,737 for New York Subways

Contracts for This Sum Let in 1926 by Transportation Board—$76,498,606 in Awards Authorized in Two Years

Contracts for subway construction amounting to $55,563,737 were awarded by the Board of Transportation of New York City in 1926. During the 2½ years of its existence the board has awarded a total of $150,324,118 in subway construction contracts, of which $10,100,690 was awarded in the last six months of 1924 and $84,659,691 in 1925. The route mileage of the construction contracts awarded in 1926 is 5.82, of which 4.32 miles is for the new city system and 1.5 miles for the Brooklyn-Manhattan Transit system. The total route mileage of contracts awarded in the 2½ years is 16.12; 12.52 miles for the city system and 3.6 miles for the B.-M.T.

The awards made in 1926 are divided as follows:

City's new subway system	$47,736,576
Interborough system	1,526,604
B.-M.T. system	5,956,724
Miscellaneous	343,833
Total	$55,563,737

Payments for the new city-owned rapid transit facilities during 1926 amounted to $52,095,502.90, divided as follows:

For city's new system	$41,847,613
For Contract 1 (I. R. T.)	96,714
For Contract 3 (I. R. T.)	9,099,931
For Contract 4 (B.-M. T.)	7,952,754
For alterations	101,307

The total rapid transit disbursements approved by the board from July, 1924, to Dec. 31, 1926, amounted to $76,498,606.26, divided as follows:

For city's new system	$49,032,133
For Contract 1 (I. R. T.)	182,312
For Contract 2 (I. R. T.)	668
For Contract 3 (I. R. T.)	9,099,431
For Contract 4 (B.-M. T.)	17,886,668
For alterations	296,891

The $47,736,576 in awards for the construction of the city's new subway system last year embraced eight major contracts amounting to $47,671,644. For borings, removal of buildings, reinterment of bodies in Nagle Cemetery on the Harlem River yard site contracts were awarded aggregating $64,932.

There are now under contract for the city's new subway system twenty-five sections of the Washington Heights-Central Park West-Eighth Avenue-Sixth Avenue-Church Street line, extending from the vicinity of Fulton Street to the northerly end of Manhattan Island.

Contracts for the East River tunnel from Fulton Street, Manhattan, to Cranberry Street, Brooklyn, are nearly ready for advertising. As soon as the injunction action instituted by Jasper A. Campbell, president of the Central Park West and Columbus Avenue Association, is decided by the Court of Appeals, the board will take action toward awarding the contracts for the 53d Street tunnel under Welfare Island to Long Island City, where the Brooklyn and Queens lines will join.

Another major contract awarded by the Board of Transportation last year was $1,063,115 for the Coney Island yard and shops of the B.-M.T. system.

Of this amount, $266,900 was for the West End line connection to the yard, $69,247 for the Culver line connection, $271,292 for grading the yard site, $125,000 for fill, $103,019 for tracks for the Sea Beach and West End line connections and $52,759 for steel for the main repair shop.

The board also awarded in the year four contracts aggregating $743,498 for lengthening the platforms of forty stations on the B.-M.T. system in Brooklyn and Manhattan. These platforms, when lengthened, will be 539 ft. long, and will accommodate eight-car trains, increasing the passenger-carrying capacity of each train 33⅓ per cent and standardizing the length of all trains in service on the B.-M.T. subway system.

Other awards were $570,974 for additions to the Lenox Avenue yard of the Interborough system, $181,806 for the completion of the Corona-Flushing line, which will be ready for operation to Main Street, Flushing, this summer, and $178,712 for tracks and for finishing the Times Square station of the Queensboro subway at 41st Street.

The board awarded a total of $4,128,471 for the completion of the Fourteenth Street-Eastern subway and its connection with the Broadway elevated line in East New York.

Under contract No. 3 with the Interborough Company, the board awarded a $218,919 contract for the construction of a transfer connection between the subway and elevated lines at 149th Street and Third Avenue, the Bronx, and one of $116,723 for an additional passageway at Canal and Varick Streets to connect with the approach to the New York and New Jersey vehicular tunnel.

In the year just ended, the board acquired by private purchase or by condemnation ownership of 176 parcels of real estate in Manhattan, Brooklyn and the Bronx with a total area of about 43 acres. Permanent easements were acquired under 38 other parcels and temporary easements were acquired at many points to provide access to the work of subway construction. The total value of the rights in real property acquired is estimated at about $10,500,000, a closer approximation being impossible because the courts in many instances have not yet fixed the awards in condemnation proceedings.

Properties at Morgantown Sold

Signing of a contract by the Monongahela West Penn Public Service Company for the purchase of the physical property of the West Virginia Utilities Company, Morgantown, W. Va., was announced at Fairmont by Capt. George M. Alexander, president of the company. Immediately after the announcement Captain Alexander left the city and his bare statement of the facts could not be amplified by other officials of the concern. No reference to the purchase price was made, but estimates by persons familiar with the property place the sale price at $4,000,000.

The announcement by the head of the Monongahela West Penn Company follows:

> According to an announcement by Capt. G. M. Alexander, president, the Monongahela West Penn Public Service Company through one of its subsidiaries has signed a contract for the purchase of all the physical property of the West Virginia Utilities Company, located in and around Morgantown. These properties include the water, natural gas, railway and electric light and power systems now a part of the West Virginia Utilities Company.
>
> Morgantown and the growing communities tributary to it have a population of more than 40,000 and for the last five years have shown a most substantial and consistent growth. It is the seat of the state university, with an attendance of some 3,000 students; it is also the center of the most recent extensive soft coal developments in the state of West Virginia.
>
> Captain Alexander stated that the Monongahela West Penn Public Service Company would probably take over the operation of the Morgantown properties some time in July.

The statement by President Alexander indicates that the property is being purchased by a subsidiary of the Monongahela West Penn, but it is not known whether it will be operated under that name.

Net Income of Chicago Railways Improves

Net earnings of the Chicago Railways, Chicago, Ill., in the year ended Jan. 31, 1927, were $1,292,673. This is the sum available for interest on the adjustment income bonds, against $1,061,548 in the preceding year. The surplus for the year after all interest and other charges was $1,092,674, against $961,548 in the preceding year. These facts are included in the nineteenth annual report of the company.

The Chicago Railways, which owns the north and west side street car lines and is the largest operating unit of the Chicago Surface Lines group, went into receivership shortly after the expiration of the franchise at the end of January. This statement will have, therefore, an unusual amount of interest. Of particular interest in the balance sheet will be a comparison of property values and bonded debt. The city purchase price of the properties came to $94,438,640, against a total debt of $103,854,255. The road, equipment and franchise are carried in the

INCOME STATEMENT OF THE CHICAGO RAILWAYS FOR YEAR ENDED JAN. 31, 1927

	1927	1926
Company's share (60 per cent) of residue receipts of Chicago Surface Lines..	$7,981,267	$7,294,604
Deduct: Joint account expenses..............	298,934	70,646
	$7,682,332	$7,223,957
Deduct: Interest at 5 per cent on capital valuation	4,713,629	4,707,592
Income divisible with city of Chicago................	$2,968,702	$2,516,365
City's 55 per cent of divisible income................	$1,632,786	$1,384,001
Company's Income:		
45 per cent of divisible income................	$1,335,916	$1,132,364
5 per cent interest allowed on capital valuation of property..............	4,713,629	4,707,592
Interest on bank balances..	162,513	124,549
Interest on treasury securities..................	73,778	73,786
Miscellaneous income.....	100	4
Total income........	$6,285,937	$6,038,297
Deductions:		
Interest accrued on—		
First mortgage bonds....	$2,784,700	$2,784,700
Consolidated mortgage bonds..............	1,693,329	1,693,329
Purchase money bonds..	203,650	203,649
Interest on loans..........	43,261	46,846
Federal income tax on interest coupons........	65,016	66,000
Corporate expenses and interest adjustments with Chicago Surface Lines...	203,304	182,222
Total deductions.....	$4,993,262	$4,976,749
Net income..........	$1,292,674	$1,061,548

Conspectus of Indexes for June, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	June 1927 **7.44**	May 1927 **7.44**	June 1926 **7.37**	Feb. 1927 **7.45**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	June 1927 **143.0**	May 1927 **144.2**	June 1926 **154.4**	Sept. 1920 **247.5**	June 1927 **143.0**
Electric Railway Wages* 1913 = 100	June 1927 **227.5**	May 1927 **227.4**	June 1926 **225.5**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	June 1927 **200.6**	May 1927 **201.0**	June 1926 **201.9**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	June 1927 **205.6**	May 1927 **206.8**	June 1926 **204.8**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	May 1927 **144.1**	April 1927 **144.2**	May 1926 **151.7**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	June 1 1927 **12.43**	May. 1 1927 **12.44**	June 1 1926 **12.76**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	May 1927 **155.4**	Apr. 1927 **153.6**	May 1926 **161.1**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	May 1927 **163 7**	Apr. 1927 **163.7**	May 1926 **167.8**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	May.31 1927 **3.051**	Apr. 30 1927 **3 456**	May 31 1926 **3.649**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	May 1927 **18.62**	Apr. 1927 **18.55**	May 1926 **18.32**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	May 1927 **1636** **39.71**	Apr. 1927 **1671** **55.36**	May 1926 **1635** **60.84**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

SURPLUS ACCOUNT OF THE CHICAGO RAILWAYS JAN. 31, 1927

Surplus, Jan. 31, 1926		$4,337,018
Add: Net income for the year		1,292,674
		$5,629,692
Deduct: interest on adjustment income bonds		
For year ended Jan. 31, 1926 (paid May 1, 1926)	$100,000	
For year ended Jan. 31, 1927 (payable Feb. 1, 1927)	100,000	200,000
Surplus Jan. 31, 1927		$5,429,692

balance sheet at the sum of $101,035,875.

The report states that the Chicago Railways during its twenty years of operation under the ordinance of 1907 and subsequent ordinances paid to the city of Chicago $24,589,605, as 55 per cent of the divisible net earnings. President Henry A. Blair said that there was expended during last year, as in the past, more than the ordinance requirements on maintenance and repairs, with the result that the physical property was in excellent condition.

Net Earnings of Illinois Power & Light Up 11 Per Cent

Gross earnings from operations of the Illinois Power & Light Corporation, Chicago, in 1926 were $31,189,628, an increase of more than 7 per cent over last year. The net earnings were $11,808,639, 11 per cent greater than in 1925. Dividends on all of the stocks outstanding were earned on a substantial basis, and a protective margin remained after the full payment of dividends. The balance sheet shows a very satisfactory financial and credit position at the end of the period.

CONSOLIDATED STATEMENT OF INCOME AND EXPENDITURES OF ILLINOIS POWER & LIGHT CORPORATION

(Year Ended Dec. 31, 1926)

Gross earnings from operation:		
Electric light and power	$16,467,204	
Electric and steam railroads	5,971,273	
City railway and bus lines	4,198,798	
Gas	3,336,916	
Heat	712,847	
Bridge	618,037	
Ice	261,304	
Water	110,476	
Miscellaneous	213	
Combined gross earnings	$31,677,074	
Less intercompany items	487,445	
Gross earnings from operation		$31,189,628
Expenses and taxes:		
Operating expenses (less intercompany $487,445.07)	$14,334,148	
Maintenance	3,772,226	
Taxes, local and federal	1,274,614	
Total expenses, maintenance and taxes		19,380,989
(Labor, fuel and other costs of producing and distributing utility service. Expenditures for repairs to keep the property in good operating condition. Estimated federal, state and local taxes.)		
Net earnings from operation		$11,808,639
(Balance remaining to pay interest on bonds and other current borrowings, dividends and to provide for depreciation.)		
Less fixed charges:		
Interest charges, etc	$5,850,033	
Bond discount amortised	262,641	6,112,675
Surplus available for dividends and depreciation		$5,695,964
Dividend on Preferred Stocks:		
Illinois Power & Light Corporation and subsidiary companies		2,590,883
		$3,105,081
Appropriated for depreciation, retirements, replacements, etc		1,721,892
(Amount appropriated from current earnings to provide for retiring, renewing or replacing physical property.)		
Balance		$1,383,189
Surplus Jan. 1, 1926		1,508,040
		$2,891,229
Dividends paid on common stock, 1926		900,000
Surplus per balance sheet		$1,991,229
(Surplus earnings reinvested in physical property or reflected in current assets, etc.)		

Intensive efforts have been continued to increase the freight, express and through passenger business of the trunk line electric railroad of the Illinois Traction System connecting Danville, Champaign, Decatur, Bloomington, Peoria, Lincoln and Springfield with Edwardsville, Granite City, Madison and St. Louis. This property was originally designed as a passenger carrying line, but great strides have been made during the last four years in the development of other business, not only interchanges of freight with practically all of the steam railroads. During 1926 more than 3,000 tons of 90-lb. rail was laid on the main division, 40,000 tons of gravel ballast was placed and more than 60,000 creosoted ties were installed.

New large type electric locomotives and new cars were put in service, all of which were constructed at the Decatur shops. A considerable amount of overhead trolley was renewed, additional feeder lines installed, the capacity of three railroad substations was doubled on the main line, and crossing signal light installations increased. The capacity of the freight house at Peoria was materially increased and new or extended sidings installed along the line to accommodate larger freight business. On the Illinois Valley division additional capacity for railroad service was installed at the LaSalle power house and improvement made in the method of furnishing energy for the operation of the road.

Portions of the Illinois Central and the Wabash Railroad tracks around Champaign and Urbana were electrified and operating rights secured thereover, thus providing a freight belt around these cities. Construction of a new freight house was started at Champaign, to be finished some time in 1927.

On the St. Louis, Troy & Eastern Railroad, operated by steam, additional large locomotives and all-steel hopper bottom coal cars were placed in service to handle additional business.

Improvements and changes have been continued in the city railway lines to effect economies of operation. The use of buses has been increased to replace certain unprofitable railway lines and to furnish service where the growth of the community has extended beyond existing car tracks. A number of garages were completed or enlarged during 1926 in order to handle the buses efficiently.

Toledo Losing Money—Little Variation in Passenger Traffic

Suggestion that the Community Traction Company, Toledo, Ohio, is losing money, patronage and good will by the dilatory methods of working out some agreeable solution to its transit problems, which will secure extensions of service, put streets in good conditions, secure better service at more reasonable fare and also enable the company to improve its equipment, is contained in the annual report made by acting Street Railway Commissioner E. L. Graumlich to the City Council.

INCOME STATEMENT OF THE COMMUNITY TRACTION COMPANY, FOR YEAR ENDED DEC. 31

	1926	1925
Passenger revenue	$3,404,105	$3,483,896
Special car revenues, express revenue, non-operating revenue, etc	156,417	149,039
Total revenue from all sources	$3,560,522	$3,632,935
Total operating expenses including taxes	$2,866,178	$2,794,724
Net income from operation.	$694,344	$838,210
Depreciation	137,906	138,091
Sinking fund—City's purchase fund	299,899	284,149
Interest on floating debt	12,831	10,238
Total deductions from income	$450,637	$432,479
Balance is amount available for the stabilising fund	$243,706	$405,731
Interest on bonds	409,955	426,260
Dividends preferred stock	87,704	86,562
Total interest and dividends	$497,659	$512,822
Net deficit	$253,952	$107,090

Total revenue of the company for 1926 was $3,560,522, compared with a gross revenue of $3,632,935 for the previous year. There was less than 1 per cent loss in passenger revenue, but a decrease in the income from rentals received from interurban lines for use of city tracks made up a large part of the difference in revenues. However, operating costs, taxes and other expenses increased, which for the year's operation produced a loss of $253,952, compared with $107,090 in 1925, after the required set-up for various reserves and charge was made for interest on bonds and dividends on preferred stock.

In explaining how the company can continue to operate on such a losing basis Commissioner Graumlich says the sinking fund credits should be taken into consideration as offsetting in a measure the deficit accumulated in the

STATEMENT OF PASSENGERS CARRIED BY COMMUNITY TRACTION COMPANY, TOLEDO

	Cash Fares	Token Fares	Children	Transfers	Total Revenue Passengers	Employees	Total Passengers
Total—1926	7,199,994	30,955,606	1,650,087	8,510,260	48,315,947	1,695,707	50,011,654
Total—1925	7,052,954	31,477,335	1,330,664	8,516,534	48,377,487	1,738,278	50,115,765

	Revenue-Miles Operated		
	Cars	Coaches	Total
Total—1926	6,667,419	338,769	7,006,188
Total—1925	6,727,174	....	6,727,174

	Car-Miles Operated	
	Community Traction Company Cars	Interurban Cars
Total—1926	6,675,677	513,174
Total—1925	6,737,633	521,499

stabilizing fund. Total loss as reflected in the stabilizing fund was $910,544 at the close of 1926. This covers the entire six years of service-at-cost operation under the Milner ordinance. However, during this period the sinking fund accounted for retirement of $1,406,000 of the bonds with some additional cash balance in the fund.

INCOME AND EXPENSE OF COACH OPERATION OF COMMUNITY TRACTION COMPANY, TOLEDO, JULY 1 TO DEC. 31, 1926

		Per Coach-Mile, Cents
Revenue		
Passenger	$71,738	21.176
Special coach—contract	8,018	......
Special coach—misc'l	2,367	3.066
Total revenue	82,123	24.242
Expense		
Maintenance	$7,996	2.360
Gas and oil	12,108	3.575
Garage expense	7,511	2.217
Transportation	31,331	9.248
Traffic	492	0.145
General and miscellaneous	6,943	2.050
Rent of coaches	23,378	6.901
Total operating expense	$89,759	26.496
Net operating revenue	$7,635	2.254
Taxes	3,952	1.167
Deficit	$11,587	3.421
Adjustment of expense		
No part of the general expense of the company has been charged against coach operation.		
Amount which we believe should be prorated to coaches is estimated at (based on revenue miles)	11,590	3.421
Deficit is adjusted	$23,177	6.842
Ratio expense (as adjusted) and taxes to total revenue, per cent		128.223

Commissioner Graumlich said in his report:

> The result of the operation under the ordinance, however, is not equally satisfactory to the car riders nor to the citizens of the city generally. The loss in revenue due to competitive bus service and the high operating costs resulting from duplicated car service and excessive power charges, together with the heavy requirements for the sinking fund, have not left sufficient money available for the required maintenance and renewal of the company's property even at a maximum rate of fare and with curtailed service.
>
> This is not only reflected in the inability of the company to render satisfactory service but it also seriously interferes with the city's public improvement program, since new track construction cannot be financed and consequently new pavements on important thoroughfares are being held up or can only be partially completed.
>
> The operation of the company has not only been handicapped, as stated, but during the past year franchise negotiations which have been continuously under way have seriously interfered with the management of the system.

Commissioner Graumlich points out that under such unsettled conditions it has been impossible to take advantage of the aggressive policies being developed by street railways in other cities for winning business. It is estimated that independent buses cause a loss of about $250,000 in revenue annually to the street railway property. Through special investigation and a more careful inspection system, pull-ins were reduced 40 per cent. The company spent $82,501 in paving between tracks and laid the equivalent of a street 36 ft. wide and 3 miles long in new and relaid brick paving.

Net Income in London, Ont., Increases

The gross earnings of the London Street Railway, London, Ont., for the year ended Dec. 31, 1926, was $626,690, a decrease of $2,202 compared with 1925. Operating expenses were $528,528, a decrease of $482 as compared with 1925. The expense of allocation was as follows: Maintenance and structure, $70,335; equipment, $54,180; power, $45,022; operation of car, $258,564; operation of buses, $44,750, and miscellaneous, $55,676. The net income after deductions for fixed charges, depreciation and Dominion income tax, amounted to $14,958, showing an increase over 1925 of $107. These facts were disclosed in the 52d annual report, submitted at the annual meeting held in February.

Continuing the policy of making improvements to the property, the company reconstructed approximately 75 per cent. of the double trackage and new special work was accomplished. Improvements covering road and equipment for the year amounted to $27,291. In addition to these improvements, the company purchased during the year, six Yellow Cab buses at a total cost of $46,160. The total improvement for the year amounted to $73,451.

The report refers to the 5-cent fare agreement renewed during the year and to the negotiations carried on with the City Council for an extension of the franchise and the purchase of the railway, both of which propositions were defeated at the municipal elections held on Dec. 6, 1926.

Included in the annual report are a seven years comparative statement of revenue and expenses under old fares (except temporary increase — five months in 1919) and a five-year comparative statement of revenues and expenses under 5-cent fare, June 14, 1922, to Dec. 31, 1926. The latter statement is reproduced in this digest.

FIVE YEARS COMPARATIVE STATEMENT OF REVENUES AND EXPENSES OF THE LONDON STREET RAILWAY

Under 5-Cent Fare—June 14, 1922, to Dec. 31, 1926

	1922	1923	1924	1925	1926
Earnings from passengers	$586,442	$685,608	$657,572	$621,079	$618,877
Other sources	8,141	7,803	7,729	7,838	7,813
Gross earnings	$594,583	$693,411	$665,302	$628,917	$626,690
Operating expenses	494,986	572,082	546,364	529,010	528,528
Net earnings	$99,597	$121,329	$118,938	$99,907	$98,162
Deduct interest on bonds, interest on loans and taxes	34,620	37,086	43,200	45,418	43,792
Net income before providing for depreciation	$64,977	$84,242	$75,737	$54,489	$54,369
Depreciation of road and equipment	35,423	37,364	38,091	38,125	38,125
Net income	$29,553	$46,877	$37,645	$16,364	$16,244
Deduct dominion income tax	2,896	4,720	3,748	1,513	1,286
Balance, net income	$26,657	$42,157	$33,897	$14,850	$14,958
Dividends paid	*15,937	†31,874	None	None	None
Balance to surplus	$10,720	$10,283	$33,897	$14,850	$14,958
Return on capital, per cent	4.18	6.61	5.32	2.33	2.34

*2½ per cent. †5 per cent.

STATISTICAL STATEMENT OF THE LONDON STREET RAILWAY

	1922	1923	1924	1925	1926
Passengers carried	13,413,945	13,865,148	13,299,634	12,552,064	12,514,582
Transfer passengers	1,536,969	1,782,195	1,749,234	1,644,584	1,780,643
Total passengers	14,950,914	15,647,343	15,048,868	14,196,648	14,295,225
Car earnings per revenue passenger, cents	4.37	4.94	4.94	4.94	4.94
Car-miles operated	1,853,622	2,124,160	2,087,746	2,040,484	2,160,678
Revenue, cents per car-mile	32.08	32.64	31.87	30.82	29.00
Total expenses in cents per car-mile	30.63	30.65	30.25	30.09	28.31
Net income per car-mile in cents	1.45	1.99	1.62	0.73	0.69

May Abandon One Line.—Abandonment of the Detroit, Lake Shore & Mount Clemens line of the Detroit United Railway, Detroit, Mich., operating between Detroit and Mount Clemens, is possible in the near future. In this connection St. Clair Shores village gave notice more than a month ago that the franchise in that village granted in 1897 and expiring June 21 would not be renewed. The line's franchise in Grosse Point Village and Grosse Point Farms has seven years more to run. The line, unprofitable for a number of years, was built as a rival to the Rapid Railway system operating between Detroit and Mount Clemens and which also was absorbed by the Detroit United Railway.

Personal Items

H. B. Cobban Heads Midwest Association

Operating Head of Oklahoma Road Elected at Recent Meeting of Railway Men in St. Louis

H. B. Cobban, Miami, Okla., secretary-treasurer and general manager of the Northeast Oklahoma Railroad, was elected president of the Midwest Electric Railway Association at the meeting held in the Hotel Chase, St. Louis, Mo., June 9, 10 and 11. The association is composed of officials and employees of electric railways in six states, Missouri, Kansas, Oklahoma, Arkansas, Nebraska and Colorado. Incidentally it might be said that Oklahoma is in line for the June meeting in 1928, as an invitation has been extended to the association to meet in Miami, the home of the new president-elect.

H. B. Cobban

Mr. Cobban has been secretary-treasurer and general manager of the Northeast Oklahoma Railroad since Dec. 1, 1919. This represented his entrance into the railway field, for before that he had been engaged in manufacturing and in jobbing. He was born in Wakeman, Ohio, on Aug. 3, 1877, and attended the grade schools in Springfield, Mo. He is a man of many interests, linked not only with the agricultural Middle West but with its mining activities and its banking and general business. He is president of the Miami Building and Loan Association, a director of the Miami Chamber of Commerce, a director of the Oklahoma Utilities Association, chairman of the industrial committee of the Miami Chamber of Commerce and president of the Miami Rotary Club. In the past he has been vice-president of the Oklahoma Utilities Association, secretary of the Miami Chamber of Commerce, president of the Miami Chamber of Commerce, a member of the Oklahoma Council of Defense, vice-chairman of all Liberty Loan drives, secretary of the Miami Building and Loan Association, vice-president of the Ottawa County Chapter of the American Red Cross, and chairman of the United States Boys Working Reserve.

Henry S. Day Goes to Providence

Henry S. Day has been appointed superintendent of equipment of the United Electric Railways, Providence, R. I. He assumed his new duties on June 16. Mr. Day has had 25 years experience in contact with direct maintenance of electric railway equipment.

He started his career with the Westinghouse Electric & Manufacturing Company as a road engineer, specializing on railway equipment in the New York territory. For five years he was in charge of maintenance and inspection of electric motive power for the New Haven road. Valuation and appraisal of electric railway properties engrossed his attention for three years when he was connected with Sanderson & Porter of New York. After duty overseas in the World War, in which he served as captain of engineers, Mr. Day returned to this country and took a position with the Kansas City Railways, Kansas City, Mo., as equipment engineer in charge of the mechanical department. In this capacity he succeeded in reducing the expenses of the department to the extent of several hundred thousand dollars a year. During the past three years he has been manager of the transportation division of the Westinghouse company.

Changes in Philadelphia Personnel Approved

The resignation of W. K. Myers as president of the Philadelphia Rapid Transit Company, effective on July 1, was submitted to the board of directors at its regular monthly meeting on June 20 and accepted by that body. Mr. Myers is relinquishing active control of the Philadelphia Rapid Transit Company to assume the duties of executive vice-president of the recently organized Mitten Bank Securities Corporation. He will continue a member of the executive committee and of the board of directors of the railway.

R. T. Senter, at present vice-president of the Philadelphia Rapid Transit Company, was elected president to succeed Mr. Myers.

In his letter of resignation to T. E. Mitten, chairman of the board of directors of the Philadelphia Rapid Transit Company, Mr. Myers said:

> At the request of the board of directors of the Mitten Bank Securities Corporation, I have accepted the position of executive vice-president of that organization.
>
> As the duties of this office will require all of my attention, I will be unable to continue as president of the Philadelphia Rapid Transit Company. I therefore submit my resignation as president of this company, effective July 1, 1927.

This formal action represents the consummation of a plan to which extended reference was made in the JOURNAL for June 11, 1927, page 1067.

J. R. Fitzpatrick Vice-President of Haskelite

James R. Fitzpatrick has been made vice-president of the Haskelite Manufacturing Corporation, Chicago, Ill. Mr. Fitzpatrick continues as secretary and member of the board of directors. He also continues in charge of sales.

Briefly, he has been with the Haskelite Manufacturing Corporation almost since the organization of the company in 1917, and has served it in all capacities from factory manager to purchasing agent and sales manager and also as an executive.

Mr. Fitzpatrick is very active in trade associations in the electric railway field. At the present time he is a member of the American Electric Railway Association special manufacturers' committee and a member of the committee on meetings and subjects. He served on the American Electric Railway Association exhibit committee in 1925. He is a member of the American Society of Civil Engineers and the Society of Automotive Engineers.

J. R. Fitzpatrick

Mr. Fitzpatrick was graduated from the Rensselaer Polytechnic Institute of Troy, New York, with the degree of civil engineer. Some time ago he was elected trustee of this institution.

J. T. Foster Purchasing Assistant to New Jersey Vice-President

Joseph T. Foster has been appointed purchasing assistant to the vice-president of the Public Service Corporation of New Jersey, Newark, parent company for the Public Service Railway and the Public Service Transportation Company, in charge of real estate and purchases. He has been in the employ of Public Service since 1914, the year in which he was graduated from Columbia University. He started in the testing laboratory of Public Service Electric Company and a year later was transferred to the engineering department of that company. In 1917 he was made an assistant engineer and in 1922 was promoted to assistant to the vice-president and general manager of Public Service Production Company. Two years later he was made assistant to the chief engineer of that company, the position he held just prior to his recent promotion.

G. H. Kelsay has resigned as electrical engineer of the Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, and has accepted a position as assistant to the president in charge of the Montpelier Foundry & Machine Company, Montpelier, Ind. He was with the property at Cleveland for eight years, a greater portion of the time in charge of substations, car maintenance and maintenance of overhead lines. He engineered and supervised the installation of the 60-cycle railway substation equipment, installing automatic substations and semi-automatic stations at a substantial saving in the power distribution and substation operation on the Cleveland Southwestern Railway. Previous to his connection with the latter company he was superintendent of power in charge of power plants, substations and distribution lines for the Union Traction Company of Anderson, Indiana. This work covered a period of fourteen years.

Judge James H. Reed Dead

Jurist Was Long an Officer of the Philadelphia Company and the Pittsburgh Railways—Notable Record in Realm of Corporation's Legal and Financial Activities

JAMES H. REED, senior vice-president and a director of the Philadelphia Company, Pittsburgh, senior vice-president and a director of the Pittsburgh Railways and an officer of many other corporations, died on June 17 after an illness of about two weeks. Judge Reed, although nearly 74 years of age, had never retired. He was at his offices daily attending to his manifold duties until two weeks before his death, which was due to a complication of ailments. At times in the course of his illness Judge Reed rallied and hopes were entertained for his recovery, but on June 15 it became apparent that the end was drawing near.

For nearly half a century Judge Reed had been one of the leading attorneys of the country. He was a leader in finance and industry, who, while active in law practice all his life, organized and aided in directing many of the greatest corporations in the United States. He was deeply interested in many philanthropic and educational activities and gave unsparingly of his time and effort in their organization and administration. He was the founder and president of the Pittsburgh Skin & Cancer Foundation and a director of the Western Pennsylvania Hospital. He was treasurer and a member of the board of trustees of the Carnegie Institute, Carnegie Institute of Technology, Carnegie Library and the Carnegie Hero Fund Commission, also vice-president and director of the United States Steel Pension Fund.

Judge Reed in 1899 prepared the charter and other preliminaries to the organization of the Consolidated Gas Company of Pittsburgh, and after this and other companies had been acquired by the Philadelphia Company he became president of the consolidated interests. He retired as president in 1919, but continued his connection with these enterprises as senior vice-president and director.

When Andrew Carnegie was approached concerning the sale of his steel company and allied possessions to the United States Steel Corporation, Judge Reed was delegated to attend to the various legal and other technicalities incident to this transaction. When the sale eventually was consummated Judge Reed became a member of the directorate of this noted organization.

An idea of the variety and extent of his associations and activities may be obtained in reading the list of some of his connections: Senior member of the law firm of Reed, Smith, Shaw & McClay, president and director of Pittsburgh, Bessemer & Lake Erie Railroad, president and director of the Union Railroad, chairman of the board of Farmers Deposit National Bank, director of Farmers Deposit Savings Bank, director of Farmers Deposit Trust Company, director of Fidelity Title & Trust Company, director of Gulf Oil Corporation, vice-president and director of Philadelphia Company and its associated companies, president and director of Reliance Life Insurance Company of Pittsburgh.

J. H. Reed

Judge Reed's elementary education was obtained in the public schools of his native city and was supplemented by study in the old Western University of Pennsylvania (now the University of Pittsburgh), from which he was graduated in 1872. He began the study of law in the office of his uncle, David Reed, at that time a foremost Pittsburgh and Pennsylvania lawyer. He was admitted to the Allegheny County bar in 1875, and soon afterward the firm of Knox & Reed was formed, the senior member being Philander Chase Knox, afterward Attorney-General of the United States and Secretary of State, closing his career as United States Senator from Pennsylvania.

This firm was successful from its start, both attorneys being corporation lawyers, with many of the largest manufacturing and commercial concerns in the city as clients. Later, when Marcus W. Acheson, judge of the United States District Court for the Western District of Pennsylvania, was elevated to the Circuit bench, Mr. Reed was nominated to the District Court vacancy, which he accepted with great reluctance. Due to this disinclination for judicial work, Judge Reed resigned within a year, and the firm of Knox & Reed resumed its activities. This firm was finally dissolved when Mr. Knox became Attorney-General under President McKinley, and the firm of Reed, Smith, Shaw & Beal, now Reed, Smith, Shaw & McClay, was formed by the remaining partners.

Judge Reed was for many years general counsel and vice-president of the Pittsburgh & Lake Erie Railroad Company, one of the most important parts of the New York Central system. Later he became general counsel for the Carnegie Steel Company, having been counsel for many of the constituents of this corporation for years before their general merging. He outlined the basis for the organization of the Pittsburgh, Bessemer & Lake Erie Railroad Company and had been its president from its formation.

Judge Reed was born on the north side of Pittsburgh on Sept. 10, 1853, son of the late Dr. Joseph Allison and Eliza (Hay) Reed.

Samuel G. Boyle

Samuel G. Boyle, for 28 years secretary-treasurer of the Louisville Railway, Louisville, Ky., and the oldest active officer of the corporation, died on June 11 at his home in Louisville. Mr. Boyle went to Louisville in 1900 as secretary-treasurer of the Louisville Railway, an outgrowth of the first railway in Louisville, founded by his father, General Boyle, and known as the Portland Avenue line. At that time Louisville was a big river handler, and there was need of a line connecting Portland and Louisville. Samuel Boyle, the son, was born at Danville, Ky., in 1860. He attended Centre College at Danville, Ky., and Johns Hopkins University. Later he edited and published the *Kentucky Stock Farmer*, was editor and publisher of the Lexington *Herald* and was also an editorial writer for that paper from 1921 to 1924.

George E. Patterson, long a resident of St. Catharines, Ont., and a pioneer in street and electric railway work in Canada, died in Pasadena, Cal., on June 12. He was 88 years old. Mr. Patterson established a carriage building business in St. Catharines in 1874 and later constructed horse cars, one of which was converted into an electric car and operated between St. Catharines and Thorold in 1887. Thirty years ago he went to Philadelphia and manufactured electrical equipment until his retirement five years ago.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Treasury Department Drops German Rail Dumping Case

No evidence having been obtained to support a suspicion of dumping, the Treasury Department has ordered collectors of customs to release appraisement reports on steel rails imported from Germany and the investigation as to dumping has been dropped.

The investigation was ordered by the Treasury last March following a complaint from a domestic producer of steel rails that an importation of rails from Germany for the Boston & Maine Railroad was at a price below the market price in Germany and hence violative of the anti-dumping law. Investigation among other producers of steel rails in this country, however, coupled with inquiries in Germany, failed to substantiate the suspicion and the complaint was withdrawn by the company which filed it.

Large Switching Equipment Order Goes to Westinghouse

The Pennsylvania Railroad has just placed with the Westinghouse Electric & Manufacturing Company a large order for switching equipment for installation on the Philadelphia to Wilmington electrification project. The order includes 39 high-speed oil circuit breakers and their relays for the operation and protection of the 11,000-volt trolleys. Breakers are rated at 1,500 amp. and insulation is provided to permit a wet test of 112,000 volts. The combined maximum operating time of the breakers and their relays under short-circuit conditions is 0.04 second. This high-speed action is necessary to prevent interference with parallel telephone cables.

Included in the order also are seventeen 66,000-volt outdoor potential transformers, six type 331 oil circuit breakers, 50 type "SV" lightning arresters and choke coils and three large grounding resistors.

Centenary Celebrated by Dixon Crucible Company

By means of a handsomely finished brochure prepared by Floyd W. Parsons, author of "American Business Methods," etc., the Joseph Dixon Crucible Company, Jersey City, N. J., is celebrating its hundreth year of business life.

Mr. Parsons' story, entitled "A Tale of Yesterday, Today and Tomorrow," has a distinct literary style skillfully employed to dignify one of America's oldest business concerns. After painting the prejudices and trials which Joseph Dixon faced in creating his business, Mr. Parsons recounts the steady and consistent strides of the company from the time Dixon's attention was called in 1827 to the discovery of graphite on a New Hampshire farm.

In paying tribute to the founder, this keen critic of American business methods writes: "It requires a peculiar type of mind and character to establish a business that will live and grow throughout a century. A study of American industry clearly discloses that the founders and builders of our oldest commercial institutions had certain characteristics in common. First was the urge to pioneer. Some satisfied this spirit by staying home and digging deep the foundations for an enduring trade structure. . . . The chief equipment of the scientist of yesterday was nothing more than inquisitive persevering minds. . . . Joseph Dixon was of that school, his was the restless, questioning brain!

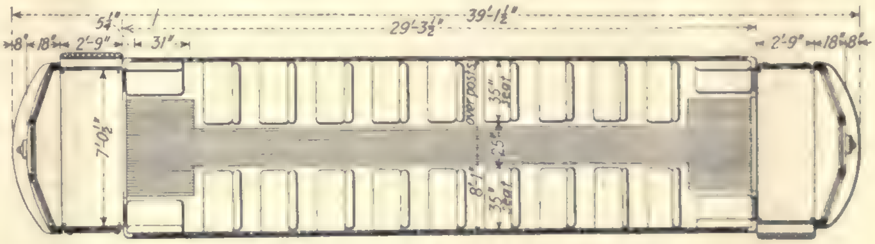
S. H. Blake Chairman of G. E. Standardization Committee

A. H. Moore, after 39 years of faithful and effective service with the General Electric Company and its associated foreign manufacturing companies, will retire on Aug. 1, 1927, on account of ill health.

S. H. Blake will succeed Mr. Moore as chairman of general and other standardizing committees and will take over his duties as of June 1, 1927.

Two New Interurban Units for Greenfield-Montague Area

Two of these trim interurban cars were added to the equipment of the Greenfield & Montague Transportation Area last month. They have a seating capacity of 32 passengers each



Seating arrangement of the Greenfield units

Greenfield & Montague Transportation Area, created by the Legislature to provide for the operation of the electric interurban line connecting Greenfield, Turners Falls and Montague, Mass., under municipal auspices, accepted delivery in May of two one-man, two-man, semi-steel interurban cars constructed by the Wason Manufacturing Company, Springfield, Mass. Specifications follow:

Date of order	Dec. 12, 1926
Date of delivery	April 30
Number of units	2
Type of unit	One-man, two-man, motor, passenger, interurban, double-end, double-truck
Number of seats	22
Length over all	39 ft.
Length over body posts	29 ft. 3½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 2½ in.
Height, rail to trolley base	10 ft. 10¾ in.
Window post spacing	31 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Brill
Car signal system	Faraday high voltage
Compressors	DH-16
Conduit	Flexible
Control	K-75 with TA switch
Couplers	1¼-in. drawbar
Curtain fixtures	Curtain Supply Co.
Curtain material	Fabrikoid K-2 color 86
Destination signs	Hunter 128 R.R.
Doors	Folding
Floor covering	Goodrich rubber
Gears and pinions	Westinghouse helical
Glass	DTA
Hand brakes	Peacock type A-14-34
Heaters	Gold Car Heating & Lighting Co.
Headlights	Crouse-Hinds portable
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Brill 3¾ x 6 in.
Motors	Westinghouse 510-E No. 4, inside hung
Roof type	Arch
Roof material	Cotton duck
Sash fixtures	J. L. Howard
Seats	Brill 201-B
Seat spacing	31 in.
Seating material	Genuine Spanish grain leather
Steps	Folding
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	U. S. 20-A
Trucks	Brill 177-E-1
Ventilators	Brill exhaust
Wheels, type	Rolled steel diameter 27 in.
Wheelguards or fenders	Wood

Trend and Status of Adopted and Eliminated Varieties of Paving Brick

Considering the varieties adopted as recognized by the permanent committee on March 20, 1925, and again on April 1, 1926, it is noted that in 1914 these four varieties constituted 53 per cent of the total shipments of paving brick, and with minor fluctuations have shown a constant gain until in 1924 they constituted 82.1 per cent of the total shipments of the industry. Shipments in 1925 in these four recognized varieties show a falling off to 74.2 per cent of the total and to 65 per cent in 1926, due primarily to the decrease in shipments in the 4-in. depth brick. The decrease in shipments of the thicker brick, accompanied by a more marked increase in shipments of the thinner brick, stands out prominently in the trend of shipments in 1926.

The one variety (3x3½x8½-in. Dunn wire-cut lug brick) eliminated on March 20, 1925, has never amounted to a big percentage of the shipments. It was first listed in 1916. Shipments of this variety during 1926 amounted to 2.8 per cent of the total shipments.

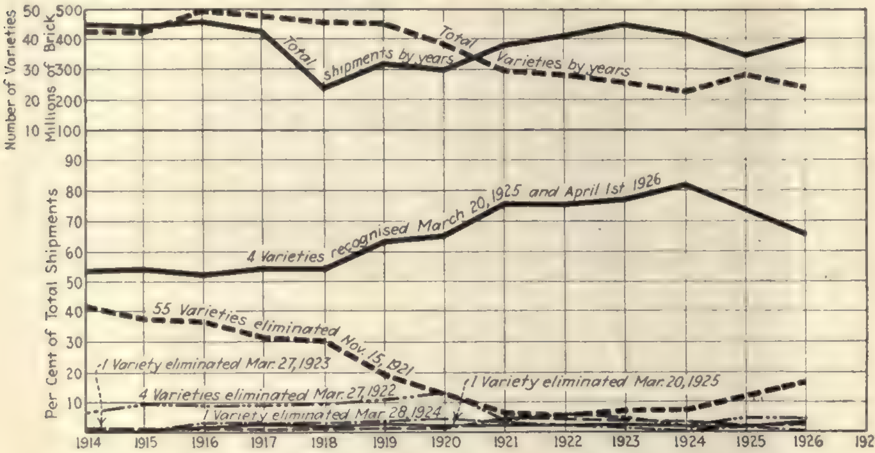


Chart of paving brick eliminated and recognized, 1914-1926

The one variety (3½x3½x8½-in. Dunn wire-cut lug brick) eliminated on March 28, 1924, has likewise never amounted to a big percentage of the shipments. It also was first listed in 1916, with 2.5 per cent. Since that year shipments have declined until in 1926 no brick of this variety were shipped.

The one variety eliminated on March 28, 1923 (4x3½x8½-in. repressed hillside brick), reached its maximum in 1921, when shipments of this variety constituted 4.8 per cent of the total for that year. It has fallen off steadily from that time, being only 2.2 per cent of the total shipments for the year 1926.

The four varieties eliminated on March 27, 1922, constituted in 1914 only 6 per cent of the total shipments of paving brick. The increase in shipments of these varieties was steady until 1920, when it reached the maximum of 15.7 per cent. Since 1921 shipments of these varieties have decreased to a total of only 4 per cent in 1926.

The 55 varieties eliminated on Nov. 15, 1921, constituted in 1914 40.9 per cent of the total shipments. The decline in shipments of these varieties was steady from 1918 to 1922 inclusive, when they constituted 5.2 per cent of the total shipments. Due primarily to the increased shipments of the 2½x4x8½-in. plain wire-cut brick, the percentage of these shipments has risen steadily since 1922, until in 1926 the total amounted to 16 per cent of those of the industry.

European Engineers Interested in Lincoln Arc Welding Prize

Mechanical engineers the engineering world over are expressing keen interest in the announcement made in New York recently by the American Society of Mechanical Engineers that they had accepted the custody of $17,500 in prize money to be given to the writers of the three best papers disclosing new information that will tend to advance the art of arc welding.

Any one in any part of the world may compete for this prize, which is being given by the Lincoln Electric Company, Cleveland, Ohio. Entrants must submit their papers in duplicate and in accordance with the rules of the competition by Jan. 1, 1928, to Calvin W. Rice, secretary of the American Society of Mechanical Engineers, 29 West 39th Street, New York City. The first prize is $10,000, the second $5,000 and the third $2,500. Mr. Rice will furnish other details if desired.

3,634 Sq. Ft. a Day

was the A.E.R.A. Exhibit Committee's average for 29 working days. Which means that at the close of business on June 18

105,402 Sq. Ft.

had been sold to

223 Applicants

This beats last year's score for the same period by 32 applicants and 3,956 sq.ft.

IT WON'T BE TOO LATE UNTIL OCT. 3

Eight One-Man Cars Ordered by Beaver Valley Traction

The Beaver Valley Traction Company, New Brighton, Pa., announces that eight one-man, city type, double-truck cars are now being constructed in the plant of the Osgood-Bradley Car Company at Worcester, Mass., on which delivery is expected in the early fall. The order, previously announced in the JOURNAL of March 12 as embracing only six units, was placed May 10. It followed the rehabilitation of ten of twenty recently purchased cars that were found not to conform with the standard of ease and refinement set by the company for its patrons.

The car bodies will be semi-steel, 44 ft. over all and seating 52 passengers. Westinghouse 510-E motors have been specified. Doors will be located on the right side only.

Clinton D. Smith, general manager, has released the subjoined specifications and plans and photographs will be published in a latter issue of the JOURNAL.

Number of units	Eight
Type of unit	one-man, motor, passenger, city, double-end, double-truck
Number of seats	52
Builder of car body	Osgood-Bradley
City and state	Worcester, Mass.
Date of order	May 10
Date of delivery	Oct. 30
Weights:	
Car body	20,000 lb.
Trucks	9,600 lb.
Equipment	5,970 lb.
Total	35,570 lb.
Bolster centers	20 ft. 0 in.
Length over all	44 ft. 0 in.
Length over body posts	30 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 1¼ in.
Window post spacing	28½ in.
Body	Semi-steel
Roof	Arch
Doors, right side only	End
Air brake	Westinghouse Traction Brake Co.
Armature bearings	Plain
Axles	Standard Steel Car
Car signal system	Consolidated
Compressors	Westinghouse DH-16
Conduit	Flexible
Control	K-35
Curtain fixtures	Curtain Supply Company
Curtain material	Curtain Supply Company
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Cleveland
Finish	Paint
Floor covering	Battleship linoleum
Gears and pinions	Helical
Glass	Crystal sheet
Hand brakes	Peacock
Heaters	Consolidated
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Standard Steel Car Co.
Lamp fixtures	30-volt lamp dome feature
Motors	Westinghouse 510-E, inside hung
Painting scheme	Body orange-sash
Roof	Arch
Roof material	Canvas
Safety car devices	Westinghouse
Sash fixtures	Edwards
Seats	Hale & Kilburn
Seat spacing	28½ in.
Seating material	Leather
Slack adjusters	Westinghouse
Steps	Folding
Step treads	Kass
Trolley catchers	Ideal
Trolley base	Nuttall No. 14
Trolley wheels	More-Jones
Trucks	Standard Steel Car Co.
Ventilators	Nichols-Lintern
Wheels	Rolled steel, diameter 28 in.
Wheelguards	H B lifeguards

More Cars for Sheffield, England

The total number of 50 new double-deck cars built under contract for the Sheffield Corporation have now been delivered. The Council's capital estimates for 1927-28 include £117,000 for

St. Louis Car Company is greatly increasing its car capacity by the opening of this modern steel erecting shop. The new structure is 1,000x135 ft. An L-shaped section at the lower end of the building will house raw materials

50 more double-deck cars, half of them to be bought under contract and the other half to be built in the corporation's shops.

$100,000 Car Modernizing Program for Virginia Company

The Virginia Electric & Power Company will spend about $100,000 in modernizing sixteen of its double-truck street cars in service at Norfolk, Va., according to latest reports. The cars will be changed from the two-man type to the one-man type. Work will be done at the Norfolk shops of the company. In many respects the rebuilt equipment will resemble the new units recently placed in service on the Naval Base line. They will have leather-upholstered seats, front and rear exits and an automatic air brake control system.

Canadian Bridge Approach to Be Improved

Anticipating heavy travel over the Falls View Bridge, the International Railway, its owner, recently announced that improvements to the Canadian bridgehead will be begun immediately after approval of plans now being prepared by Findlay & Foulis of Niagara Falls, Ont. The plans are in accordance with an outline discussed by B. J. Yungbluth, president of the railway, with prominent business men, newspaper publishers, city and park officials from both sides of the river early this year.

Work on improvements of the American end of the bridge, providing a maximum of eight inspection lanes instead of two, with greatly increased parking space and diversion of the electric railway tracks from the motor traffic lane, is now under way. Improvement of the Canadian end will involve demolition of the present buildings and construction of new buildings, harmonizing with the surroundings, and a widening of the bridge approach.

St. Louis Car Company Opens New Steel Erecting Shop

To increase its electric railway equipment capacity and to facilitate the building of steel coaches for steam railroads the St. Louis Car Company is just completing a new steel fabricating and erection shop of the most modern type. This shop is 1,000 ft. long and 135 ft. wide, built in two bays with two 10-ton traveling cranes in each bay. The shop is particularly well lighted, as the construction is of steel, erected on a low concrete foundation. The sides and roof bays are glazed with fenestra steel sash, as shown in the illustration.

Raw material, such as steel plates and shapes, are protected from the weather in a completely inclosed building, constructed for the purpose, forming an L at the lower end of the shop, and this building is also equipped with an overhead crane and runway for the expeditious handling of materials.

Shears, presses and punches are at the lower end of the shop where the material is prepared for fabrication. Four tracks built on steel jigs and concrete bases on which the cars are erected are outstanding features of the new shop. They will be perfectly aligned and surfaced for accurate construction. Facilities are such that either freight cars or passenger equipment can be efficiently produced.

When these cars are turned out at the upper end of the building they are ready for the finishing and paint shops. Additional capacity for finishing results from the new shop, as the former steel car department building No. 3 hereafter will be utilized for that purpose.

Non-Union Production Will Supply Demands for Coal

A seasonal slowing up of industrial activity is shown in the April coal consumption tonnage. The total consumption of bituminous and anthracite coal in the United States and Canada was 38,600,000 tons as of May 1. The average daily consumption amounted to 1,286,666 tons. Business in general shows a gradual seasonal curtailment; no marked recessions are in evidence.

The National Association of Purchasing Agents' coal survey gives a total of 72,288,000 tons as the amount on hand as of May 1, an average day's supply for all industries of 56 days.

The effect of the strike in union bituminous fields is clearly reflected in the production figures for April. More than 35,775,000 tons of bituminous were produced and 7,334,000 tons of anthracite, giving a total production of 43,109,000. The April bituminous figure compared with the March production of 60,147,000 at first glance might arouse some concern. However, when the present rate of consumption is taken into consideration, and the fact that industrial activity will diminish as the summer wears on, it shows clearly that the output of the non-union mines can very nearly provide for current needs.

The April production of byproduct

COMPARATIVE ESTIMATES OF U. S. PRODUCTION AND CONSUMPTION, AND STOCKS OF ANTHRACITE AND BITUMINOUS COAL IN INDUSTRIES OF THE UNITED STATES AND CANADA

	U. S. Production	Industrial Consumption	On Hand in Industries
December	66,104,000	45,085,000	49,373,000
January	63,128,000	44,671,000	55,010,000
February	58,756,000	43,536,000	57,450,000
March	64,075,000	43,237,000	65,735,000
April	43,109,000	38,600,000	77,455,000
May 1	...	....	72,288,000

coke was 3,707,000 tons, a decrease of 172,000 tons compared with the output during the preceding month. Seventy-seven active plants produced about 85 per cent of their capacity. The output of the beehive coke declined, the estimated total for the month being 780,000 tons, a decrease of 110,000 tons, or 12.4 per cent as compared with March. The output of all coke was 4,487,000 tons, of which 82.6 per cent was contributed by byproduct ovens and 17.4 per cent by beehive ovens. Production in the non-union fields has been well sustained, and if coal in storage is reasonably retained through the summer there is little reason to expect a change in the situation much before September.

The market conditions along the Atlantic Coast are dull. Considerable quantities of coal are available and some of it is being offered at a price that is not very attractive to the distributors. This is the quiet season for bituminous and, coupled with the ample stocks generally held throughout the East, practically no market stimulus exists.

On the West Coast the continued overproduction of oil has had some effect on coal consumption. Low prices on fuel oil have heightened the competitive situation.

New Home for Rockford Public Service Buses

Buses of the Rockford Public Service Company, Rockford, Ill., will be quartered in a new second-floor garage to be built by the company at its carhouse at Kishwaukee Street and First Avenue. Construction work will start as soon as bids are received and formal award made this month. The building is 200 x 98 ft. and the second floor will cover practically all this space. The enlargement will cost $50,000. A brick, fireproof structure has been specified.

Worm-Drive Axles Discussed in Timken Magazine

The May issue of *Timken Magazine*, published by the Timken Detroit Axle Company, Detroit, Mich., carries two interesting articles on the application of worm-drive axles to electric railway cars. Another article presents the Timken worm gear "driving unit." The first article explains the experimental installation made on the trucks of a car owned by the Chicago & Joliet Electric Railway, this having been treated in the Journal for March 26, April 2, 16, 23 and 30 and May 7, 14 and 28. Both articles are profusely illustrated.

More Buses to Be Purchased for Cleveland

Traction Commissioner Ballou at Cleveland has announced that he will urge the City Council to approve at once the purchase of 25 new buses for the Cleveland Railway. Fifteen of the new buses would be used in rush hour service and emergencies and ten be reserved for chartering for picnics and other social outings. Mr. Ballou is quoted:

> It is imperative that these buses be purchased immediately. They are badly needed to keep the company's bus service in operation on an efficiency basis. Any argument that we should not have them because all of our bus routes are running at a loss is unsound. If we didn't have the buses we would have to lay tracks for street cars at a much higher cost.

Mr. Ballou declared that while the railway could use 50 buses he would recommend the purchase of only 25 at this time.

Metal Prices Show Little Change

The week ended June 22 has been a quiet one in the non-ferrous metal markets. Copper has sold in better volume than for two weeks, but the total business has not been large. Prices are steady. Lead has been somewhat quieter, with prices about the same as last week. Zinc has been reasonably active.

Some copper groups continue out of the market, quoting nominally 12⅝ or 12¾ cents for Eastern deliveries, but there are several sellers, and have been all week, at 12½ cents, at which price all the sales have been made so far as Connecticut buyers are concerned. Deliveries were well distributed over June, July and August, though one sale was made for as far ahead as November at 12½ cents. Wire mills have bought a little more liberally, though the wire business continues unsatisfactory, it is said.

Compared with March, the last previous 31-day month, lead production has declined nearly 11,000 tons. United States, Mexico and Spain were the largest contributors. The American Smelting & Refining Company has continued its official contract price in New York at 6.40 cents. Some small sales have been made at 6.45 cents. In St. Louis second hands sold a little lead at 6.10 cents during the early part of the market week, but sales were made at 6.125 cents and 6.15 cents each day. June 21 and 22 the prevailing price was 6.15 cents.

Prompt Straits tin has fluctuated between 67½ and 68 cents, with the price of June 22 slightly higher than that of a week ago. Spot metal is scarce both here and in London. This is reflected in the wide backwardation which amounts to about £12 in Europe. July Straits is almost 2 cents under prompt.

Practically no change has occurred in the zinc market this week. The metal has been in good demand from galvanizers and the volume of sales has been about up to the average. Most of the business has been at 6.20 cents, with scattering sales at 6.175, 6.225, and 6.25 cents. High grade is unchanged, spot carloads being offered at 8 cents, delivered in the East.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	June 21, 1927
Copper, electrolytic, cents per lb.	12.27
Copper wire, cents per lb.	15.125
Lead, cents per lb.	6.40
Zinc, cents per lb.	6.20
Tin, Straits, cents per lb.	67.5
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.50
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings, Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.80
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.58

Rolling Stock

Butte Electric Railway, Butte, Mont., accepted delivery in May of one six-cylinder, street car type, 29-passenger Fageol bus which was shipped from the plant of the Fageol Motors Company, Oakland, Cal.

Market Street Railway, San Francisco, Cal., in April received from the Fageol Motors Company, Oakland, Cal., one six-cylinder street car type coach.

Los Angeles Railway, Los Angeles, Cal., received from the Fageol Motors Company, Oakland, Cal., eight six-cylinder, street car type coaches during March and April.

McKinley Traction System, Peoria, Ill., has put into service four new Studebaker 21-passenger buses equipped with the special Big Six engines. The exterior of each is painted in tangerine and ivory, the molding in black and the roof in maroon. The interior is finished in mahogany and the seats are upholstered with brown Spanish leather.

Track and Roadway

Carolina Light & Power Company, Raleigh, N. C., is reported by General Manager C. S. Walters as about to begin work on the College Street loop of its electric railway line, for which a franchise was voted in May.

Janesville Traction Company, Janesville, Wis., is rebuilding its tracks on South Franklin Street between Pleasant and Galena Streets. The main part of the improvement plan is the laying of concrete along the track and the welding of joints. Plans are also under way for a new track at the Academy railroad crossing and also to rebuild the track on south Main Street.

Shops and Buildings

Municipal Railway, St. Petersburg, Fla., recently opened its new carhouse, which represents an expenditure of approximately $200,000. The structure is equipped to handle all heavy car repair work and to refinish rolling stock.

Carolina Light & Power Company, Raleigh, N. C., will erect a new $175,000 carhouse at Asheville, N. C. The structure will house 50 electric cars and 50 buses on a site at Mud Cut just off French Broad Avenue.

Worcester Consolidated Street Railway, Worcester, Mass., has awarded a contract to the J. W. Bishop Company, 109 Foster Street, Worcester, for the construction of a garage on Grove Street to provide quarters for the buses, to include a repairing service. Henry R. Kent Company, Rutherford, N. J., is engineer and architect.

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superiority of
some things is
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Peacock Staffless Brakes are found on most of the modern cars in use today. Why? They are fast, they have three times the braking power of ordinary equipment. They guarantee the meeting of an emergency.

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Lyman Tube & Supply Co., Ltd., Montreal, Can.

What SUPERTWIST Adds to Goodyear Tires

In Yellowstone National Park, the tires used exclusively by the Yellowstone Park Transportation Company are Goodyear Tires of the type illustrated here—the Goodyear Heavy Duty All-Weather Tread Pneumatic

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus Tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other injuries. It thus insures virtually *double* the *carcass* life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

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LOWER maintenance cost—longer life of chassis and body! These are the two points every fleet owner concedes as vital in the profitable operation of motor trucks and busses.

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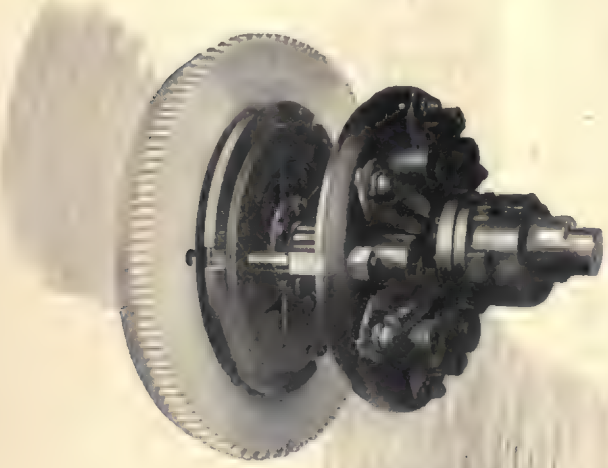
THE SHOCK ELIMINATORS FOR TRUCKS-BUSSES-PASSENGER CARS

EXPERIENCE



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Automotive Clutches
and Radiators

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PROTEX GLASS is the only motor bus protective glass on the market economically possible for motor bus safety. It will not scatter. It is brilliant, solid, and will not discolor. A fine strand of steel wire, solidly imbedded in the glass and running horizontally every two inches holds the pieces together when the glass breaks. There is no flying glass! And 65% of all collision injuries are flying glass injuries.

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Modern car for Montreal Tramways, by Canadian Car & Foundry Co. Edwards Metal Sash is used.

Durable
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Edwards Metal Sash wins good will because it meets the modern trend in car design.

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Car builders can furnish Edwards Metal Sash in a type to fit your needs. Specify it on your next order, and ask us to send you your copy of our Catalog S which describes all types of Edwards Metal Sash.

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Edwards Metal Sash

Sold 140 Carloads of coal— *in hot weather*

IT WAS SWELTERING May weather in Omaha—a bad time, you might think, to sell coal. Yet a coal company manager and his assistant compiled a list of 200 dealers in Nebraska, Iowa and Missouri who were good winter customers. Two men in three days made the calls, the charges approximating $200. They sold 140 carloads, $21,000 worth. Ordinarily it took three salesmen two months to cover this same territory. Never before in hot weather had sales run so high.

FROM ALL KINDS OF BUSINESSES come reports of the use of long distance calls to get more accomplished, at less cost. Sometimes a task can be done in days by telephone that otherwise would take months. Business can be secured that otherwise would be lost. Salesmen and executives can conserve their productive time and so increase the good results of their work.

Long Distance is as important to inter-community and inter-sectional business as the local telephone is to local affairs. How can any business concern reach its greatest development without a regular use of long distance calls?

Anywhere is as close as your telephone. Is there some distant call that should be made now? You'll be surprised how little it will cost. . . . . . *Number, please?*

BELL LONG DISTANCE SERVICE

"It gives us and a *water-tight*

Chas. T. Long, Resident Engineer of the Public Service Company, with offices at 733 Fourth Street, Portsmouth, Ohio

a smooth track area condition at the rail"

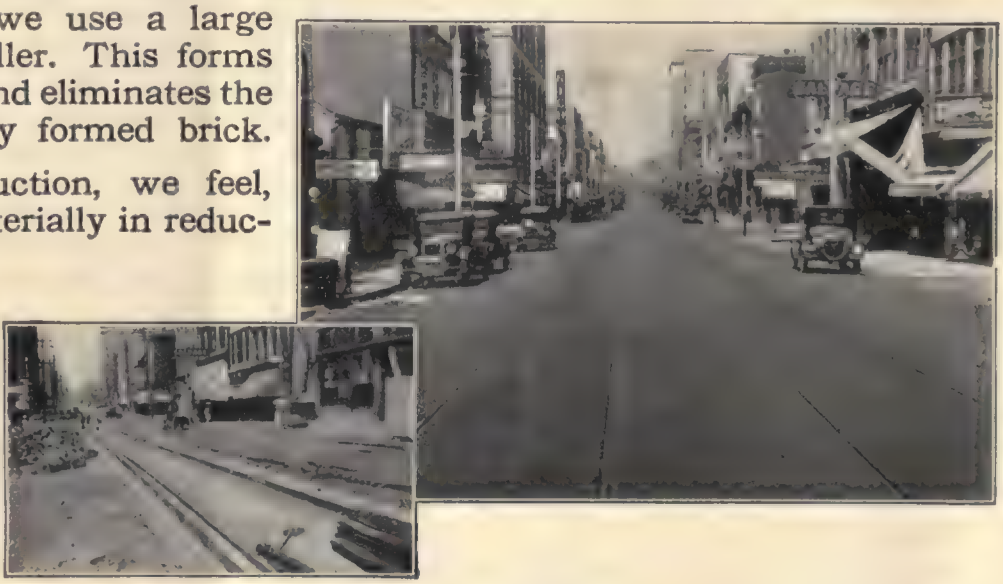
"WHERE brick construction is used," said Chas. T. Long, Resident Engineer of the Public Service Company, Portsmouth, Ohio, "the installation and maintenance of street railway tracks present some rather unique problems.

"We have accomplished much toward the solution of these difficulties by using an asphaltic cushion between the rails and the brick. This method of construction gives us a square, flat surface against which to lay the brick, and a water-tight condition at the rail, as well. Then, inside the rail, we use a large section of rail filler. This forms our flangeway and eliminates the need for specially formed brick.

"Such construction, we feel, has aided us materially in reducing track noise, and in keeping the track area smooth."

It is significant that in Carey Elastite System of Track Insulation, the Portsmouth Public Service Company has found the solution to their difficulties, as Mr. Long points out above. Write for full information about this remarkable development.

The Philip Carey Company
Lockland, Cincinnati, Ohio

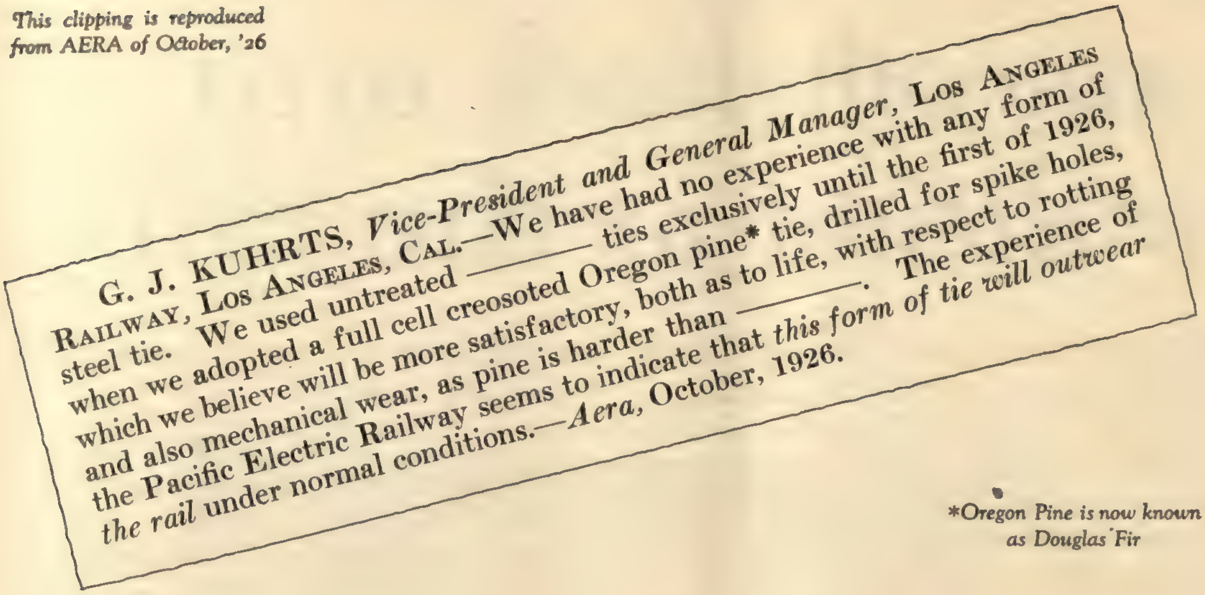


Views of the Portsmouth Public Service Company tracks on Chillicothe Street, Portsmouth, Ohio. In the photo of the finished tracks, note the excellent condition of the flangeway and the smooth surface in the track area.

Carey REG. U.S. PAT. OFF.
Elastite TRADE MARK REGD. U.S. PATENT OFFICE

SYSTEM OF
TRACK INSULATION

This clipping is reproduced from AERA of October, '26



G. J. KUHRTS, *Vice-President and General Manager*, LOS ANGELES RAILWAY, LOS ANGELES, CAL.—We have had no experience with any form of steel tie. We used untreated ——— ties exclusively until the first of 1926, when we adopted a full cell creosoted Oregon pine* tie, drilled for spike holes, which we believe will be more satisfactory, both as to life, with respect to rotting and also mechanical wear, as pine is harder than ———. The experience of the Pacific Electric Railway seems to indicate that *this form of tie will outwear the rail* under normal conditions.—*Aera*, October, 1926.

**Oregon Pine is now known as Douglas Fir*

Making durability *doubly* durable

DOUGLAS FIR stands high among woods in resistance to decay, being excelled in durability only by such woods as the cedars and cypresses. 85% to 90% of a Douglas Fir log is heartwood, hence it is an easy matter to obtain Douglas Fir lumber and timbers in *all heartwood* where durability under exposure is necessary.

The very properties of Douglas Fir that make it naturally durable—particularly its high heartwood content and its lack of permeability to water—also make preservative treatment more of a problem than with spongy woods. On the other hand, with woods of spongy grain that are easily creosoted, go coarse grain, large knots and lower strength values than in close-grained Douglas Fir.

But today the scientific treatment of Douglas Fir—doubling and tripling its durability—is a commercial process that has long since passed the experimental stage. Several plants are specializing on the preservative treatment of Douglas Fir, and numerous railroads have installed and are successfully operating apparatus for the same purpose. Proper methods of impregnation retain the inherent strength of Douglas Fir—and treated timbers can be used at the same working stresses as untreated—a factor of importance in connection with structural timbers.

When you require lumber and timbers—in any size and length—that must be strong and durable under adverse conditions, specify Douglas Fir—treated if you think it necessary. Douglas Fir is obtainable in every important lumber market—at a reasonable price.

We will be glad to send you complete technical data for your files, and to answer questions that may arise regarding the uses and treatment of Douglas Fir. *Address*, West Coast Lumber Bureau, 562 T Stuart Building, Seattle, Washington.

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Spoksteel *by*

The Strongest Wheels ever built for Buses and Trucks

A Product of the World's Largest Wheel Manufacturers

Demountable at the Hub—Interchangeable on Hubs for Dual Steel Wheels

The Spoksteel wheel combines the super-strength of a one-piece forged steel wheel member with the convenience and other recognized advantages of spoke construction. No previous type of wheel has ever approached the Spoksteel average of durability, safety, weight-saving, coolness, quiet, easy maintenance, and fine appearance. This far-reaching advance is the result of years of development by Motor Wheel, world's largest wheel makers.

For the first time, highest grade material is used in a steel wheel. Strength is multiplied. Every form of stress is accurately distributed.

The mounting is as much better as the wheel itself. Larger studs are possible; they take no radial stress at all, and at least 50% less torque. Hence Spoksteel equipment assures the highest possible resistance to shock, looseness, and permanent deflection.

The inherent advantages of Spoksteel design and construction are fully realized in service, because these wheels must mount perfectly—there is no other way. All studs and nuts are right-hand; in dual mounting the inner wheels stay in place independently; and the final locking is positive.

Reducing depreciation, maintenance and labor costs, Spoksteel wheels also produce many indirect economies. Tires are protected by the excellent radiation properties of Spoksteel wheels. Proper inflation is encouraged because valves are accessible. Brake wear is less and adjustments are fewer because Spoksteel wheels can be kept clean on the inner side.

Wheel noises cannot develop in Spoksteel wheels, and chassis sounds are not magnified. Spoksteel silence and good looks are factors in attracting and holding bus business. Spoksteel design and construction assure lowest wheel and tire costs in handling the business.

It is another of the notable developments which are responsible for the clear leadership of Motor Wheel. A test set of Spoksteel wheels—readily applied to standard hubs—will reveal new possibilities for improving production and operation of buses and trucks of every type.

MOTOR WHEEL CORPORATION, Lansing, Michigan

Motor Wheel

Strongest

Easiest Mounting, Inflation, Cleaning and Care

High Carbon Forged Steel

The practical application of this far better wheel material was made possible only by Motor Wheel experience and facilities. Spoksteel wheels are far stronger without excess weight—important in reducing tonnage—and vital in relieving tires.

Cool Running

The spoked design, character of material, rim application, and mounting of Spoksteel wheels all tend to improve radiation. Impartial competitive tests have recorded the ability of Spoksteel wheels to keep tires many degrees cooler—much further below critical temperatures.

Perfect Mounting

Piloted to hubs, Spoksteel wheels assure best load distribution over greatest possible area. The studs used greatly exceed standard strength, carry no radial load, and only a fraction of the torque. Broken studs, chewed-up holes and cracked wheels become a thing of the past.

Positive Locking

The Spoksteel locking flange is a development of the pioneer Motor Wheel design which has been one of the chief factors in the general success of steel wheels. Complication and delicate parts are eliminated. Incorrect application is quite impossible. Wheel changes are facilitated because spoke-type wheels are always more easily handled. And in dual service the inner Spoksteel wheel stays in place positively while the second wheel is applied. Both wheels lock with one operation.

Silence, Cleanliness, Convenience

Spoksteel wheels are permanently silent and they do not "cage" or magnify other chassis sounds. Dirt is not stored up and dumped into the brakes. Tire inflation is easy and quick. In emergencies, wheel repairs can be properly made without special costly machinery or factory facilities.

Single and Dual

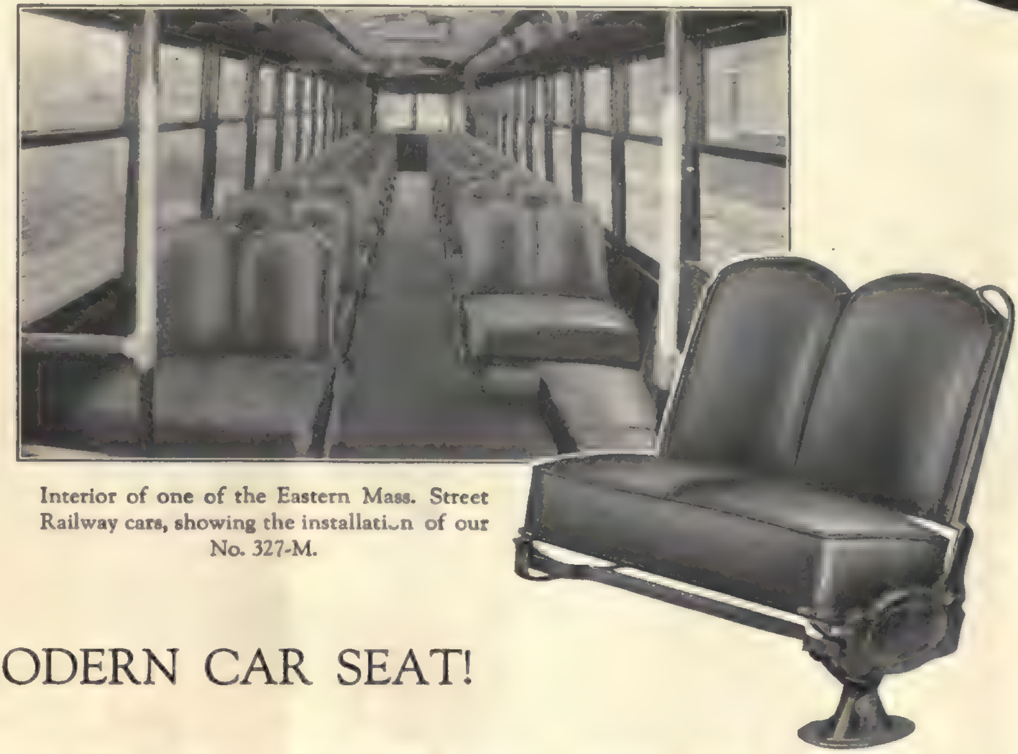
The full advantages of pneumatic tires are now available for every operator of buses or trucks. An experimental set of Spoksteel wheels—single and dual—will set up new figures for low-cost and high-mileage.

Motor Wheel
PRODUCTS

MOTOR WHEEL CORPORATION
LANSING, MICHIGAN

101 YEARS OF MANUFACTURING EXPERIENCE

Cane Webbing may
be ordered through
any H-W sales office.



Interior of one of the Eastern Mass. Street Railway cars, showing the installation of our No. 327-M.

A MODERN CAR SEAT!

THE Eastern Massachusetts Street Railway was in the market for a modern car seat that would increase the attractiveness and comfort of its cars. It finally selected our 327-M—the new, fast-selling Heywood-Wakefield design shown above.

This seat has deep, double spring cushions. Mechanism rails are set in. The individual backs are properly pitched for comfort.

Our car seating experts will be glad to help you decide on the best seating equipment for your needs. This service is free through any H-W sales office.

We shall be glad to send you complete information on this practical seat, as well as a copy of our new Bus Seat Catalogue.

Heywood-Wakefield
REG. U.S. PAT. OFF.

Heywood-Wakefield Co., Wakefield, Mass.; 516 West 34th St., New York, N. Y.; 439 Railway Exchange Bldg., Chicago, Ill. H. G. Cook, Hobart Bldg., San Francisco, Cal. The G. F. Cotter Supply Co., Houston, Texas. F. N. Grigg, 630 Louisiana Ave., Washington, D. C. The Railway & Power Engineering Corp., 133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada.

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MANUFACTURERS *to serve* YOU
more efficiently

THROUGH McGraw-Hill questionnaires we have been able to give manufacturers facts which have helped them standardize on sizes most acceptable in a particular industry.

We have also through McGraw-Hill questionnaires been able to convince manufacturers that they have been delinquent in rendering service.

So when you receive a McGraw-Hill questionnaire you can fill it out, confident that it will return to you in the form of better service to your business.

The Publishers

There is a
TONCAN CULVERT
Buried in the Neponset Carhouse Yard

THE installation of a Toncan Culvert in the Neponset yards of the Boston Elevated Railway embodies every reason for their use wherever a culvert is required.

Obviously it was imperative to select a culvert material that possessed the vitality to warrant placing it beyond the reach of visual inspection. Toncan Iron was chosen.

Toncan Iron has the natural corrosion resistance of iron increased by the addition of copper and molybdenum. The resultant alloy provides a resistance to corrosion heretofore unattainable.

You may not have to bury your culverts beyond easy access but it is profitable and sound business to buy culverts that can be so placed. Specify Toncan Iron.

CENTRAL ALLOY STEEL CORP., *Massillon*, OHIO
World's Largest and Most Highly Specialized Alloy Steel Producers
Makers of Agathon Alloy Steels
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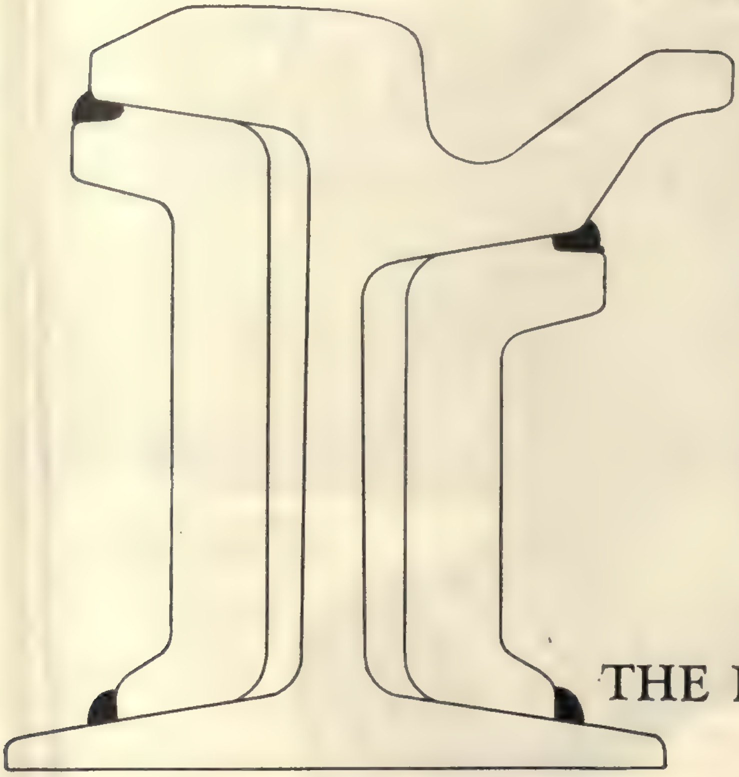
TONCAN COPPER MO-LYB-DEN-UM IRON



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For EFFICIENT, ECONOMICAL

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Do you believe in statistics? Rely on performance records? If so the performance records of the many “Weld Plates” now in use will convince you that they lead the bar-weld joints in efficiency and economy.

“Weld Plates” represent the most modern welding practice. They are the strongest and most up-to-date plates rolled especially for electric welded joints. Note the shape—the grooves for retaining plenty of weld metal along the upper edges—the wide contact areas at top and bottom—the suitability for the use of short bolts.

A trial will convince you of their efficiency and economy.

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US 20A base with Timken Bearings

Ever Grease a Trolley Base?

If you have ever greased one of the older types, you will appreciate the lubrication features of the US 20A trolley base. The base contains reservoirs which require filling but once every six months; and then all that is necessary is to remove a pipe plug and replenish the lubricant. The lubrication of the working parts of the US 20A is positive and reliable at all times.

The lubricant is securely held in an upright metal cup from which it is impossible for it to leak out and deface the car roof. This is accomplished without the use of leather gaskets or other makeshift arrangements.

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bulletin No. 46.

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When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

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265 Chestnut St., corner Atlantic Ave.,
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SEARCHLIGHT SECTION

POSITION VACANT

WELDING foreman. Must be thoroughly experienced in applying Lincoln seam welded joints and in general track reclamation work by welding methods. Give education and experience in detail in reply and submit references when requested. Replies will be held confidential. Work to be on a property in the New England States having about 175 miles of track in paved streets and also some tee rail. P-14, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

ENGINEER, desires position as roadmaster or track superintendent. Experienced in steam road location and construction, also electric railway construction. Ability to handle men and get results. At present employed as track superintendent on electric railway. Correspondence invited. PW-16, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITION wanted as superintendent. Have had more than 20 years' experience in both interurban and city operation. References furnished. PW-15, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT of railways, with 20 years' experience desires, for personal reasons, to make change. Nationwide reputation as railway operator, can take full charge. Has ability to handle men and show results. Correspondence invited and treated in confidence. PW-979, Electric Railway Journal, 7 So. Dearborn Street, Chicago, Ill.

Motors For Sale

50—101 B-2 Motors at a bargain. All in good condition. Will sell any number desired. Address

Northern Ohio Power and Light Co.
Akron, Ohio
Attention P. V. C. See

Buying Good Used Equipment

is frequently the difference between having good needed equipment or doing without it.

OFFICIAL PROPOSALS

Bids: July 7.

Installing Contact Rail and Bonding Track Broad Street Subway

DEPARTMENT OF CITY TRANSIT
11th Floor, 1211 Chestnut St.
Philadelphia, Pa., June 23, 1927.

Sealed proposals, addressed to the undersigned, at the office above mentioned, will be received until 11 o'clock A.M. (Eastern Standard Time), on Thursday, July 7, 1927, and publicly opened immediately thereafter, for installation of the contact rail and the bonding of the track in the Broad Street Subway and Terminal Yard, Contract No. 164.

Specifications and plans may be seen at the office of the Department on the 12th floor, 1211 Chestnut Street, and copies of same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of fifty (50) dollars will be required for the specifications and plans. This deposit will be refunded upon return of the specifications and plans in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accompanied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia, to the amount of five (5) per cent of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

H. E. EHLERS,
Director.

FOR SALE

2—Electric Locomotives. Birney Cars. Modern Double Truck Light-Weight Steel Cars.

All in first class operating condition.

FS-18, Electric Railway Journal
Tenth Ave. at 36th St., New York City

FOR SALE

29—Whs 508 Motors
36—K-35 Controllers

TRANSIT EQUIPMENT COMPANY
Cars — Motors
501 Fifth Avenue, New York

FOR SALE

15 BIRNEY SAFETY CARS

Brill Built

West. 508 or G. E. 264 Motors
Cars Complete—Low Price—Fine Condition

ELECTRIC EQUIPMENT CO.
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LANG QUALITY

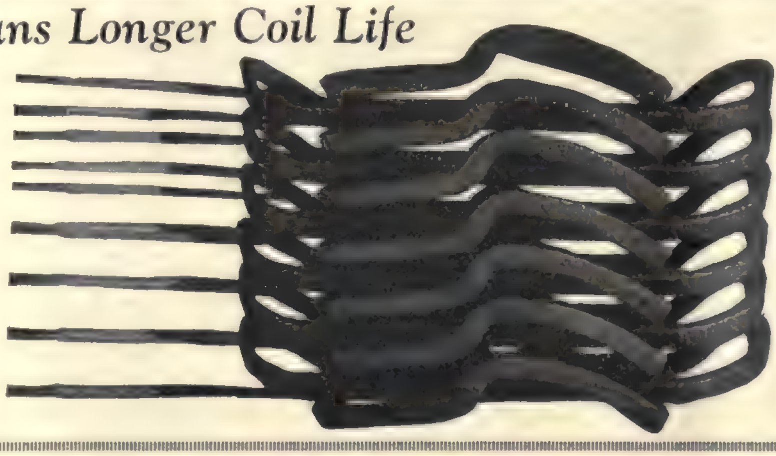
The same Lang quality that we build into new Lang bus bodies goes into the work of

REBUILDING, PAINTING & SERVICING

any bus body in our shops. We will be glad to furnish estimates on Lang quality work for your buses.

THE LANG BODY COMPANY - Cleveland, Ohio

Right Installation Means Longer Coil Life



Thirty years' experience making coils has enabled us to develop a product second to none.

Our experience has taught us that proper installation reduces maintenance costs and insures longer coil life.

Write our engineering department. They will be glad to advise you as to the best methods of coil installation.

Elliott-Thompson Electric Co.
Ajax Bldg., Cleveland, Ohio

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

- **Advertising, Street Car**
  - Collier, Inc., Barron G.
- **Air Brakes**
  - Westinghouse Air Brake Co.
- **Air Springs**
  - Cleveland Pneumatic Tool Co.
- **Anchors, Guy**
  - Elec. Service Supplies Co.
  - Ohio Brass Co.
  - Westinghouse E. & M Co.
- **Armature Shop Tools**
  - Columbia Machine Works
  - Elec. Service Supplies Co.
- **Automatic Return Switch Stands**
  - Ramapo Ajax Corp.
- **Automatic Safety Switch Stands**
  - Ramapo Ajax Corp.
- **Axles**
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  - Bethlehem Steel Co.
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Illinois Steel Co.
  - St. Louis Car Co.
  - Standard Steel Works
  - Taylor Electric Truck Co.
  - Westinghouse E. & M. Co.
- **Axles, Front**
  - Shuler Axle Co.
- **Axles (Front & Rear) Motor Truck & Passenger Car**
  - Timken-Detroit Axle Co.
- **Axles, Steel**
  - Carnegie Steel Co.
- **Axles, Trailer & Motor Bus**
  - Timken-Detroit Axle Co.
- **Babbitting Devices**
  - Columbia Machine Works & M. I. Co.
- **Badges and Buttons**
  - Elec. Service Supplies Co.
  - International Register Co.
- **Batteries, Dry**
  - Nichols-Lintern Co.
- **Bearings and Bearing Metals**
  - Bemis Car Truck Co.
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Columbia Machine Works & M. I. Co.
  - General Electric Co.
  - St. Louis Car Co.
  - Taylor Electric Truck Co.
  - Westinghouse E. & M. Co.
- **Bearings, Center and Roller Side**
  - Cincinnati Car Co.
  - Columbia Machine Works
  - Stucki Co., A.
- **Bells and Buzzers**
  - Consolidated Car Heating Co.
- **Bells and Gongs**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Columbia Machine Works & M. I. Co.
  - Elec. Service Supplies Co.
  - St. Louis Car Co.
- **Benders, Rail**
  - Railway Trackwork Co.
- **Bodies, Bus**
  - Brill Co., The J. G.
  - St. Louis Car Co.
- **Body Material, Haskelite and Plymetl**
  - Haskelite Mfg. Corp.
- **Boilers**
  - Babcock & Wilcox Co.
- **Bolts and Nuts, Track**
  - Illinois Steel Co.
- **Bond Testers**
  - American Steel & Wire Co.
  - Electric Service Supplies Co.
- **Bonding Apparatus**
  - American Steel & Wire Co.
  - Elec. Service Supplies Co.
  - Ohio Brass Co.
  - Railway Trackwork Co.
  - Una Welding & Bonding Co.
- **Bonds, Rail**
  - American Steel & Wire Co.
  - Elec. Service Supplies Co.
  - General Electric Co.
  - Ohio Brass Co.
  - Railway Trackwork Co.
  - Una Welding & Bonding Co.
  - Westinghouse E. & M. Co.
- **Book Publishers**
  - McGraw-Hill Book Co.
- **Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)**
  - Bates Expanded Steel Truss Co.
  - Columbia Machine Works
  - Elec. Ry. Equipment Co.
  - Elec. Service Supplies Co.
  - Hubbard & Co.
  - Ohio Brass Co.
- **Brake Adjusters**
  - Brill Co., The J. G
  - Cincinnati Car Co.
  - National Ry. Appliance Co.
  - Westinghouse Tr. Br. Co.
- **Brake Shoes**
  - American Brake Shoe & Foundry Co.
  - Bemis Car Truck Co.
  - Brill Co., The J. G.
  - St. Louis Car Co.
  - Taylor Electric Truck Co.
- **Brake Testers**
  - National Ry. Appliance Co.
- **Brakes, Brake Systems and Brake Parts**
  - Bemis Car Truck Co
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Columbia Machine Works & M. I. Co.
  - General Electric Co.
  - National Brake Co.
  - St. Louis Car Co.
  - Taylor Electric Truck Co.
  - Westinghouse Tr. Br. Co.
- **Brakes, Magnetic Rail**
  - Cincinnati Car Co.
- **Brushes, Carbon**
  - General Electric Co.
  - Jeandron, W. J.
  - LeCarbone Co.
  - Westinghouse E. & M. Co.
- **Brushholders**
  - Columbia Machine Works
- **Bulkheads**
  - Haskelite Mfg. Corp.
- **Buses**
  - Studebaker Corp. of Amer.
- **Bus Lighting**
  - National Ry. Appliance Co.
- **Bushings, Case Hardened and Manganese**
  - Bemis Car Truck Co.
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Columbia Machine Works
  - St. Louis Car Co.
- **Cables (See Wires and Cables)**
- **Cambric Tapes, Yellow and Black Varnish**
  - Irvington Varnish & Ins. Co.
- **Carbon Brushes (See Brushes, Carbon)**
- **Car Lighting Fixtures**
  - Elec. Service Supplies Co.
- **Car Panel Safety Switches**
  - Consolidated Car Heating Co.
  - Westinghouse E. & M. Co.
- **Car Steps, Safety**
  - Cincinnati Car Co.
- **Car Wheels, Rolled Steel**
  - Bethlehem Steel Co.
- **Cars, Dump**
  - Brill Co., The J. G.
  - Differential Steel Car Co.
  - St. Louis Car Co.
- **Cars, Gas-Electric**
  - Brill Co., The J. G.
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Cars, Gas, Rail**
  - Brill Co., The J. G.
  - St. Louis Car Co.
- **Cars, Passenger, Freight, Express, etc.**
  - American Car Co.
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Kuhlman Car Co., G. C.
  - St. Louis Car Co.
  - Wason Mfg. Co.
- **Cars, Second Hand**
  - Electric Equipment Co.
- **Cars, Self-Propelled**
  - Brill Co., The J. G.
  - General Electric Co.
- **Castings, Brass Composition or Copper**
  - Cincinnati Car Co.
  - Columbia Machine Works & M. I. Co.
- **Castings, Gray Iron and Steel**
  - American Steel Foundries
  - Bemis Car Track Co.
  - Columbia Machine Works & M. I. Co.
  - St. Louis Car Co.
  - Standard Steel Works
- **Castings, Malleable & Brass**
  - Bemis Car Truck Co.
  - Columbia Machine Works & M. I. Co.
  - St. Louis Car Co.
- **Catchers and Retrievers, Trolley**
  - Elec. Service Supplies Co.
  - Ohio Brass Co.
  - Wood Co., Chas N.
- **Catenary Construction**
  - Archbold-Brady Co.
- **Ceiling Car**
  - Haskelite Mfg. Corp.
- **Ceilings, Plywood, Panels**
  - Haskelite Mfg. Corp.
- **Chairs, Parlor Car**
  - Heywood-Wakefield Co.
- **Change Carriers**
  - Cleveland Fare Box Co.
  - Electric Service Supplies Co.
- **Change Trays**
  - Cincinnati Car Co.
- **Circuit-Breakers**
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Clamps and Connectors for Wires and Cables**
  - Columbia Machine Works
  - Elec. Ry. Equipment Co.
  - Elec. Service Supplies Co.
  - General Electric Co.
  - Hubbard & Co.
  - Ohio Brass Co.
  - Westinghouse E. & M. Co.
- **Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Ohio Brass Co.
  - St. Louis Car Co.
- **Clusters and Sockets**
  - General Electric Co
- **Clutches**
  - Long Mfg. Co.
- **Coil Banding and Winding Machines**
  - Columbia Machine Works & M. I. Co.
  - Elec. Service Supplies Co.
  - Westinghouse E. & M. Co.
- **Coils, Armature and Field**
  - Columbia Machine Works & M. I. Co.
  - Eliot-Thompson Co.
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Coils, Choke and Kicking**
  - Elec. Service Supplies Co.
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Coin Changers**
  - Illinois Motive Equip. Co.
- **Coin Counting Machines**
  - Cleveland Fare Box Co.
  - International Register Co.
- **Coin Sorting Machines**
  - Cleveland Fare Box Co.
- **Coin Wrappers**
  - Cleveland Fare Box Co.
- **Commutator Slotters**
  - Columbia Machine Works
  - Elec. Service Supplies Co.
  - General Electric Co.
  - Westinghouse E. & M. Co.
  - Wood Co., Chas. N.
- **Commutator Truing Devices**
  - General Electric Co.
- **Commutators or Parts**
  - Cameron Electrical Mfg. Co.
  - Columbia Machine Works & M. I. Co.
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Compressors, Air**
  - General Electric Co.
  - Westinghouse Tr. Br. Co.
- **Condensers**
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Condensor Papers**
  - Irvington Varnish & Ins. Co.
- **Connectors, Solderless**
  - Westinghouse E. & M. Co.
- **Connectors, Trailer Car**
  - Columbia Machine Works
  - Consolidated Car Heating Co.
  - Elec. Service Supplies Co.
  - Ohio Brass Co.
- **Controllers or Parts**
  - Columbia Machine Works & M. I. Co.
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Controller Regulators**
  - Elec. Service Supplies Co.
- **Controlling Systems**
  - General Electric Co
  - Westinghouse E. & M. Co.
- **Converters, Rotary**
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Copper Wire**
  - American Brass Co
  - American Steel & Wire Co.
  - Anaconda Copper Mining Co
- **Copper Wire Instruments, Measuring, Testing and Recording**
  - American Brass Co.
  - Anaconda Copper Mining Co.
- **Cord, Bell, Trolley, Register**
  - American Steel & Wire Co.
  - Brill Co., The J. G.
  - Elec. Service Supplies Co.
  - International Register Co.
  - Roebling's Sons Co., John A.
  - St. Louis Car Co.
  - Samson Cordage Works
- **Cord Connectors and Couplers**
  - Elec. Service Supplies Co.
  - Samson Cordage Works
  - Wood Co., Chas. N.
- **Couplers, Car**
  - American Steel Foundries
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - St. Louis Car Co.
  - Ohio Brass Co.
  - Westinghouse Traction Brake Co.
- **Cowl Ventilators**
  - Nichols-Lintern Co.
- **Cranes, Hoists & Lifts**
  - Electric Service Supplies Co.
- **Cross Arms (See Brackets)**
- **Crossing Foundations**
  - International Steel Tie Co.
- **Crossings**
  - Ramapo Ajax Corp.
  - Wm. Wharton, Jr. & Co.
- **Crossings, Frogs & Switches**
  - Ramapo Ajax Corp.
  - Wm. Wharton, Jr. & Co.
- **Crossings, Manganese**
  - Bethlehem Steel Co.
  - Ramapo Ajax Corp.
  - Wm. Wharton, Jr. & Co.
- **Crossings, Track (See Track Special Work)**
- **Crossings, Trolley**
  - Ohio Brass Co.
  - Westinghouse E. & M. Co.
- **Culverts**
  - Central Alloy Steel Corp.
- **Curtains & Curtain Fixtures**
  - Brill Co., The J. G.
  - Edwards Co., O. M.
  - St. Louis Car Co.
- **Dealer's Machinery & Second Hand Equipment**
  - Electric Equipment Co.
  - Lang Body Co.
  - Northern Ohio Power & Lt. Co.
  - Transit Equip. Co.
- **Derailing Devices (See also Track Work)**
- **Derailing Switches**
  - Ramapo Ajax Corp.
- **Destination Signs**
  - Columbia Machine Works & M. I. Co.
  - Elec. Service Supplies Co.
- **Detective Service**
  - Wish-Service, P. Edward
- **Door Operating Devices**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Consolidated Car Heating Co.
  - National Pneumatic Co.
- **Doors & Door Fixtures**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Edwards Co., O. M.
  - General Electric Co.
  - Hale-Kilburn Co.
  - St. Louis Car Co.
- **Doors, Folding Vestibule**
  - National Pneumatic Co.
- **Drills, Track**
  - American Steel & Wire Co.
  - Electric Service Supplies Co.
  - Ohio Brass Co.
- **Dryers, Sand**
  - Electric Service Supplies Co.
  - Ohio Brass Co.
  - Westinghouse E. & M. Co.
- **Ears**
  - Columbia Machine Works & M. I. Co.
  - Electric Service Supplies Co.
  - Ohio Brass Co.
  - Westinghouse E. & M. Co.
- **Electric Grinders**
  - Railway Trackwork Co.
- **Electrical Wires and Cables**
  - Amer. Electrical Works.
  - American Steel & Wire Co
  - John A. Roebling's Sons Co
- **Electrodes, Carbon**
  - Railway Trackwork Co.
  - Una Welding & Bonding Co
- **Electrodes, Steel**
  - Railway Trackwork Co.
  - Una Welding & Bonding Co
- **Enamel**
  - Du Pont de Nemours & Co., E. I.
- **Engineers, Consulting, Contracting and Operating**
  - Archbold-Brady Co.
  - Beeler, John A.
  - Buchanan & Layne Corp.
  - Byllesby Co., H. M.
  - Day & Zimmermann, Inc
  - Faile & Co., E. H.
  - Ford, Bacon & Davis
  - Hemphill & Wells
  - Holst, Engelhardt W.
  - Jackson, Walter
  - Kelker & DeLeuw
  - Linn & Marshall Co.
  - McClellan & Junkersfeld
  - Richey, Albert S.
  - Sanderson & Porter
  - Stevens & Wood
  - Stone & Webster Co.
  - White Eng. Corp., The J. G
- **Engines, Gas, Oil or Steam**
  - Westinghouse E. & M. Co
- **Exterior Side Panels**
  - Haskelite Mfg. Corp
- **Fare Boxes**
  - Cleveland Fare Box Co.
  - Illinois Motive Equip. Co.
  - Perey Mfg. Co.
- **Fare Registers**
  - Electric Service Supplies Co
  - Ohmer Fare Register Co.
- **Fences, Woven Wire & Fence Posts**
  - American Steel & Wire Co
- **Fenders and Wheel Guards**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Consolidated Car Fender Co
  - St. Louis Car Co.
  - Star Brass Works
  - Wood Co., Chas. N.
- **Fibre and Fibre Tubing**
  - Westinghouse E. & M. Co
- **Field Coils (See Coils)**
- **Floodlights**
  - Electric Service Supplies Co
- **Floor, Sub**
  - Haskelite Mfg. Corp.
- **Floors**
  - Haskelite Mfg. Corp.
- **Forgings**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - Standard Steel Works
- **Frogs & Crossings, Tee Rail**
  - Bethlehem Steel Co.
  - Ramapo Ajax Corp.
  - Wm. Wharton, Jr. & Co.
- **Frogs, Track (See Track Work)**
- **Frogs, Trolley**
  - Electric Service Supplies Co
  - Ohio Brass Co.
  - Westinghouse E. & M. Co
- **Fuses and Fuse Boxes**
  - Columbia Machine Works & M. I. Co.
  - Consolidated Car Heating Co
  - General Electric Co.
  - Westinghouse E. & M. Co
- **Fuses, Refillable**
  - General Electric Co.
- **Gaskets**
  - Westinghouse Tr. Br. Co.
- **Gas Producers**
  - Westinghouse E. & M. Co
- **Gates, Car**
  - Brill Co., The J. G.
  - Cincinnati Car Co.
  - St. Louis Car Co.
- **Gauges, Oil and Water**
  - Ohio Brass Co.
- **Gear Blanks**
  - Brill Co., The J. G.
  - Standard Steel Works
- **Gear Cases**
  - Chillingworth Mfg. Co.
  - Columbia Machine Works & M. I. Co.
  - Electric Service Supplies Co
  - Westinghouse E. & M. Co.
- **Gears and Pinions**
  - Bemis Car Truck Co.
  - Columbia Machine Works & M. I. Co.
  - Electric Service Supplies Co
  - General Electric Co.
  - Nat'l Ry. Appliance Co.
  - R. D. Nuttall Co.
- **Generating Sets, Gas-Electric**
  - General Electric Co.
- **Generators**
  - General Electric Co.
  - Westinghouse E. & M. Co.
- **Girder Rails**
  - Bethlehem Steel Co.
  - Lorain Steel Co.
- **Glass**
  - Protex Glass Co.
- **Gongs (See Bells and Gongs)**
- **Greases (See Lubricants)**
- **Grinders, Portable**
  - Railway Trackwork Co
- **Grinders, Portable Electric**
  - Railway Trackwork Co
- **Grinding Bricks and Wheels**
  - Railway Trackwork Co.
- **Guard Rail Clamps**
  - Ramapo Ajax Corp.
- **Guard Rails, Tee Rail & Manganese**
  - Ramapo Ajax Corp.
  - Wm. Wharton, Jr. & Co.

Continued on p. 50

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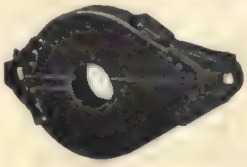

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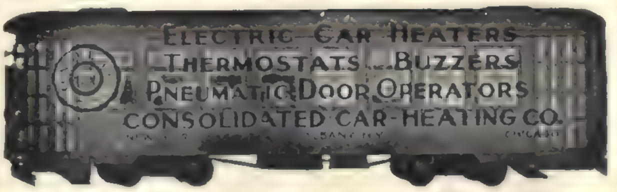

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Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

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Columbia Machine Works
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Star Brass Works

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General Electric Co.
Ohio Brass Co.
St. Louis Car Co.

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Columbia Machine Works & M. I. Co.
Haskelite Mfg. Corp.

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Nichols-Lintern Co.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

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Columbia Machine Works & M. I. Co.

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Traction Brake Co.

Instruments, Measuring, Testing and Recording
American Steel & Wire Co.
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National Ry. Appliance Co.
Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

Insulating Silk
Irvington Varnish & Ins. Co.

Insulating Varnishes
Irvington Varnish & Ins. Co.

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Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

Insulation Slots
Irvington Varnish & Ins. Co.

Insulator Pins
Elec. Service Supplies Co.
Hubbard & Co.

Insulators (See also Line Materials)
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Interior Side Linings
Haskelite Mfg. Corp.

Interurban Cars (See Cars)

Jacks (See also Cranes, Hoists and Lifts)
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.

Joints, Rail (See Rail Joints)

Journal Boxes
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.

Lacquer
Du Pont de Nemours & Co., E. I.

Lamp Guards and Fixtures
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Arc & Incandescent (See also Headlights)
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Signal and Marker
Elec. Service Supplies Co.
Nichols-Lintern Co.
Ohio Brass Co

Lanterns, Classification
Nichols-Lintern Co.

Letter Boards
Cincinnati Car Co.
Haskelite Mfg. Corp.

Lighting Fixtures, Interior
Electric Service Supplies Co.

Lightning Protection
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Line Material (See also Brackets, Insulators, Wires, etc.)
Archbold-Brady Co.
Electric Ry. Equipment Co.
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General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Locking Spring Boxes
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Cincinnati Car Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Lubricating Engineers
Universal Lubricating Co.

Lubricants, Oil and Grease
Universal Lubricating Co.

Lumber
West Coast Lumber Bureau

Manganese Parts
Bemis Car Truck Co.

Manganese Steel Guard Rails
Ramapo Ajax Corp.
Wm. Wharton Jr. & Co.

Manganese Steel, Special Track Work
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.

Manganese Steel Switches, Frogs and Crossings
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Meters (See Instruments)

Mirrors, Inside & Outside
Cincinnati Car Co.

Motor and Generator Sets
General Electric Co.

Motor Buses (See Buses)

Motors, Electric
General Electric Co.
Westinghouse E. & M. Co.

Motorman's Seats
Brill Co., The J. G.
Cincinnati Car Co.
Elec. Service Supplies Co.
Heywood-Wakefield Co.
St. Louis Car Co.
Wood Co., Chas. N.

Nuts and Bolts
Bemis Car Truck Co.
Cincinnati Car Co.
Hubbard & Co.

Oils (See Lubricants)

Omnibuses (See Buses)

Packing
Westinghouse Traction Brake Co.

Paint
Du Pont de Nemours & Co., E. I.

Paints and Varnishes (Insulating)
Elec. Service Supplies Co.
Irvington Varnish & Ins. Co.

Paints & Varnishes, Railway
National Ry. Appliance Co.

Panels, Outside, Inside
Haskelite Mfg. Corp.

Pickup, Trolley Wire
Elec. Service Supplies Co.
Ohio Brass Co

Pinion Pullers
Elec. Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.

Pinions (See Gears)

Pins, Case Hardened, Wood and Iron
Ohio Brass Co.
Westinghouse Traction Brake Co.

Pipe Fittings
Standard Steel Works
Westinghouse Tr. Brake Co.

Planers (See Machine Tools)

Plates for Tee Rail Switches
Ramapo Ajax Corp.

Pliers, Rubber Insulated
Elec. Service Supplies Co.

Plywood, Roofs, Headlinings, Floors, Interior Panels, Bulkheads, Truss Planks
Haskelite Mfg. Corp.

Pole Line Hardware
Bethlehem Steel Co.
Elec. Service Supplies Co
Ohio Brass Co.

Pole Reinforcing
Hubbard & Co.

Poles, Metal Street
Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Hubbard & Co.

Poles and Ties Treated
Bell Lumber Co .

Poles, Ties, Posts, Piling & Lumber
Naugle Pole & Tie Co.

Poles, Trolley
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Continued on p. 53

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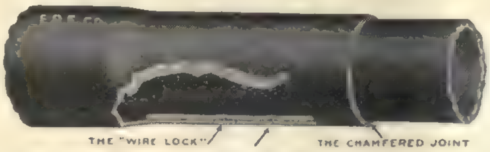

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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page

A

American Brass Co., The...... 51
American Car Co............54-55
American Electrical Works.... 51
American Steel Foundries 6
American Steel & Wire Co...... 49
American Telephone & Telegraph Co. 31
Anaconda Copper Mining Co.... 51
Archbold-Brady Co. 45

B

Babcock & Wilcox Co......... 45
Bates Expanded Steel Truss Co. 49
Beeler Organization 44
Bemis Car Truck Co.......... 52
Bethlehem Steel Co........... 45
Brill Co., The J. G..........54-55
Buchanan & Layng Corp...... 44
Byllesby Engineering & Management Corp. 44

C

Cameron Electrical Mfg. Co.... 51
Carey Co., Philip, The.......32-33
Carnegie Steel Co.............. 46
Central Alloy Steel Co........ 41
Chillingworth Mfg. Co........ 49
Cincinnati Car Co...........16-17
Cleveland Fare Box Co........ 45
Cleveland Pneumatic Tool Co., The 26
Collier, Inc., Barron G. .Front Cover
Columbia Machine Works, The. 46
Consolidated Car Fender Co.... 52
Consolidated Car Heating Co.... 49

D

Day & Zimmermann, Inc...... 44
Dayton Mechanical Tie Co...... 19
Differential Steel Car Co., The.. 52
Du Pont de Nemours & Co., Inc., E. I. 25

Page

E

Edwards Co., O. M........... 30
Electric Equipment Co........ 47
Electric Ry. Equipment Co.... 51
Electric Service Supplies Co.... 9
Elliott Thompson Electric Co. . 47

F

Faile & Co., E. H............ 44
Ford, Bacon & Davis.......... 44
"For Sale" Ads............... 47

G

General Electric Co......20-21-22
Goodyear Tire & Rubber Co.... 24
Gold Car Heating & Ltg. Co.... 52

H

Hale-Kilburn Co.............. 45
Haskelite Mfg. Corp.......... 45
Heywood-Wakefield Co......... 39
"Help Wanted" Ads........... 47
Hemphill & Wells 44
Holst, Englehardt W.......... 44
Hubbard & Co................ 52

I

Illinois Motive Equipment Co.. 45
Illinois Steel Co.............. 18
International Register Co...... 49
International Steel Tie Co., The. 7
Irvington Varnish & Insulator Co. 51

J

Jackson, Walter 44
Jeandron, W. J............... 42

Page

K

Kelker, DeLeuw & Co........ 45
Kuhlman Car Co...........54-55

L

Lang Body Co............... 47
LeCarbone Co............... 42
Linn & Marshall, Inc.......... 44
Long Mfg. Co................ 27
Lorain Steel Co.............. 49

M

McClellan & Junkersfeld 44
McGraw-Hill Book Co......... 46
Motor Wheel Corp., Insert 35-36-37-38

N

Nachod and U. S. Signal Co.... 51
National Brake Co., Inc...... 23
National Pneumatic Co........ 15
National Ry. Appliance Co..... 49
Naugle Pole & Tie Co........ 52
Nichols-Lintern Co............ 52
Northern Ohio Pwr. & Lt. Co... 47
Nuttall Co., R. D............. 43

O

Ohio Brass Co................ 5
Okonite-Callender Cable Company, Inc., The............ 51
Okonite Co., The 51

P

Perey Mfg. Co., Inc........... 52
Positions Wanted and Vacant... 47
Protex Glass Co.............28-29

R

Rail Joint Co., The.......... 42
Railway Track-work Co....... 49
Railway Utility Co........... 52

Page

Ramapo Ajax Corp.......... 51
Richey, Albert 44
Roebling's Sons Co., John A.... 51

S

St. Louis Car Co............... 8
Samson Cordage Works........ 51
Sanderson & Porter........... 44
Searchlight Section 47
Shuler Axle Co................ 43
Smith Heater Co., Peter...... 52
Standard Steel Works Co...... 42
Star Brass Works............. 52
Stevens & Wood, Inc.......... 44
Stone & Webster 44
Stucki Co., A................ 52
Studebaker Corporation of America, The. .Insert 11-12-13-14

T

Timken-Detroit Axle Co. Back Cover
Taylor Electric Truck Co...... 45
Transit Equip. Co............ 47

U

Una Welding & Bonding Co.... 45
Universal Lubricating Co...... 49

W

"Want" Ads 47
Wason Mfg. Co............54-55
West Coast Lumber Bureau.... 34
Westinghouse Electric & Mfg. Co. 2-4
Westinghouse Traction Brake Co. 10
Wharton, Jr. & Co., Inc., Wm. 49
"What and Where to Buy," 48-50-53
Wish Service, The P. Edw..... 45
White Eng. Corp., The J. G.... 44
Wood Co., Chas. N............ 51

WHAT AND WHERE TO BUY—Continued from page 50

Trolley Material, Overhead
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Trolley Wheel Bushings
Star Brass Works

Trolley Wheels (See Wheels Trolley)

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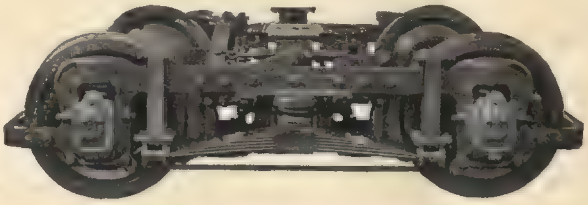

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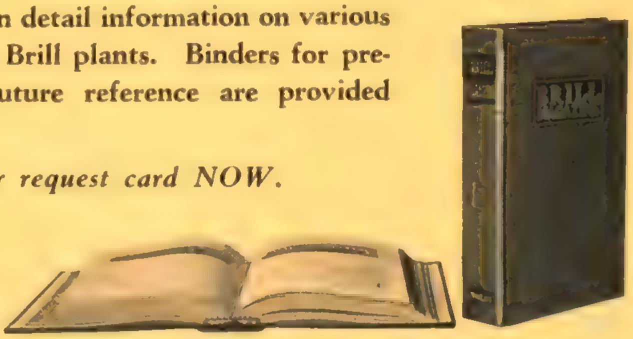

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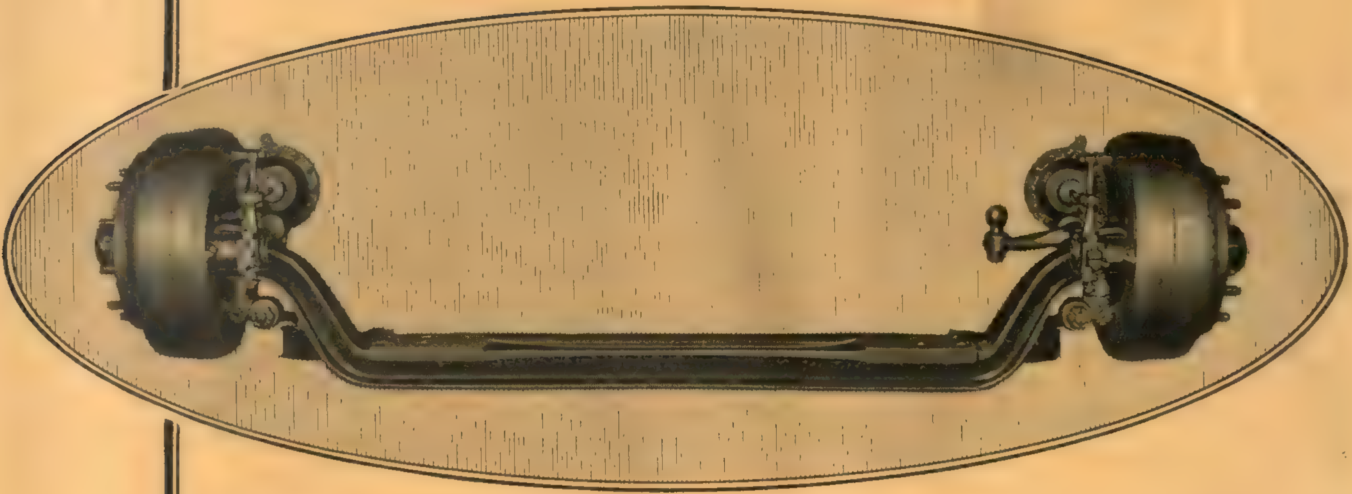

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